

ESTUARY NEWS

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

The Clean-water Economy

By Jennifer Adkins, Executive Director, Partnership for the Delaware Estuary

Clean water is at the heart of our vision for a healthy Delaware River and Bay – not just because it’s critical for fish and wildlife. It’s also at the heart of our economy, and people’s lives and livelihoods.

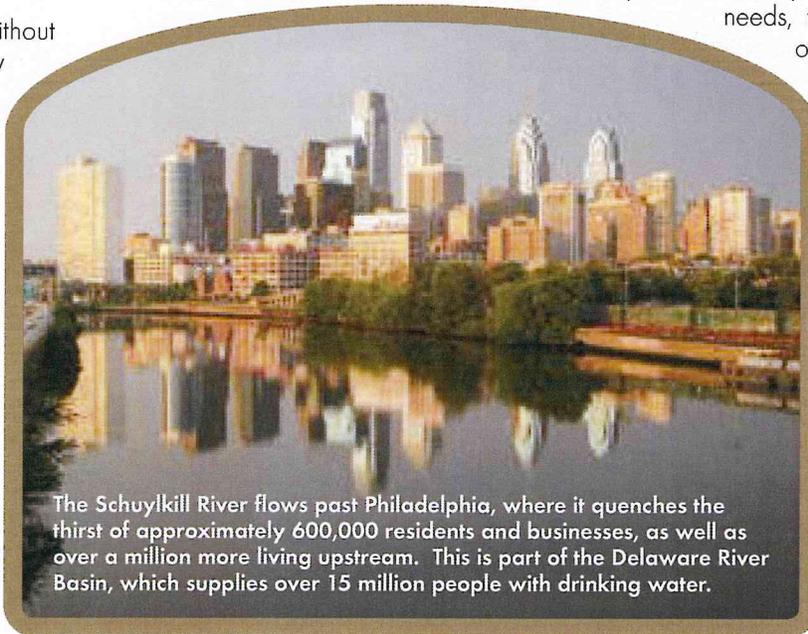
People can’t survive without clean water. We all know it, but it’s not something we think about much, at least not in this part of the world. Think about all the water you use every day to drink, shower, cook, clean, and flush the toilet. It’s probably about 80 to 100 gallons per day. If you live in a place that drains to the Delaware River, there is a good chance it comes from rivers and streams. In fact, the rivers and streams in our watershed also provide water to millions of people living

outside the watershed. Thanks to these rivers and streams, and the agencies that manage our water resources, we get this water at a bargain; about \$40 per month, on average, for every household.

If you had to buy bottled water to meet these needs, that cost would skyrocket to over \$75,000. Imagine what that would do to your pocketbook!

Plants and animals can’t live without clean water either. And people can’t live without plants and animals. Agriculture is still a major sector of the economy in Pennsylvania, Delaware, and New Jersey, and this produces the plants and animals we rely on for food. Like agriculture, commercial fisheries are another part of the food production system that

continued on page 2



The Schuylkill River flows past Philadelphia, where it quenches the thirst of approximately 600,000 residents and businesses, as well as over a million more living upstream. This is part of the Delaware River Basin, which supplies over 15 million people with drinking water.

Credit: Rebecca Chanoux, courtesy of the Schuylkill Action Network

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rely on clean water. Plants, animals, and the streams and bays they live in and around are also a major factor in many types of recreation, like fishing, hunting, hiking, boating, and wildlife watching. Together, agriculture, commercial fisheries, and activities like these provide an estimated 32,000 jobs and almost \$3.4 billion annually in the Delaware Estuary region (the lower half of the Delaware River Basin).

Businesses can't survive without clean water either. They need it for the same things that people do at home. Many businesses in our region also need water to make the products they sell. Ever wonder why there is so much industry along the Delaware River? Businesses like refineries and power plants need massive amounts of water to cool their industrial processes, and ports for transportation. Industrial cooling water may not have to be as clean as water for drinking, but water pollution can cause problems in industrial systems too, and affect the bottom lines of companies. For other businesses, like breweries, water is a direct ingredient and its quality is of the utmost importance. The

"Together, agriculture, commercial fisheries, and recreational activities provide an estimated 32,000 jobs and almost \$3.4 billion annually in the Delaware Estuary region."

accessibility of clean, plentiful, and affordable water is important for every business in our region and the millions of people who work for them.

This is the clean-water economy. Together we can help grow it by using innovative ways to make the water in the rivers and streams of the Delaware Estuary cleaner. By restoring wetlands and shellfish, we are restoring nature's own systems for cleaning the waters of our rivers and bays. By promoting tools like rain gardens, forested buffers along streams, and storm drain marking we are showing people how to keep pollution out of the rivers and streams in their neighborhoods.

Next time you take a drink from the tap, whether it's at home or your local restaurant or bar, think about

your local rivers and streams. On September 28, in recognition of National Estuaries Day, raise a toast to all those rivers and streams that make clean water in our glasses possible, and know that we will be toasting with you! ■

Celebrate National Estuaries Day on September 28 by posting a photo of your toast to our rivers and bays on [Facebook.com/DelawareEstuary.org](https://www.facebook.com/DelawareEstuary.org). You can also join us for a toast at the Hayride & Beer Tasting listed on page 14.

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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Restoring the Health of the Delaware Estuary

By Thomas Fikslin, Ph.D., Branch Manager, Delaware River Basin Commission

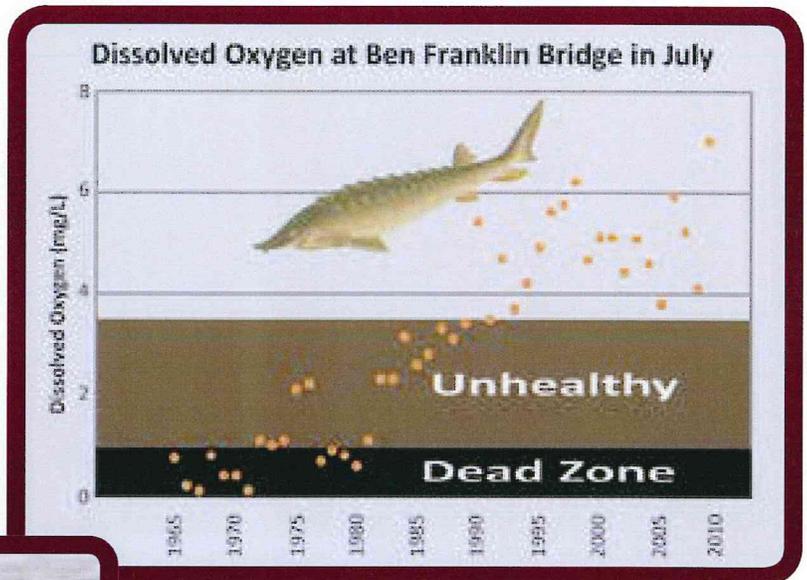
Fifty years ago, four states and the federal government entered into a compact to restore the ecological health of the Delaware River Estuary. Why? Because levels of dissolved oxygen had been near zero from mid-April to early October for a stretch of the river from the Benjamin Franklin Bridge to the Pennsylvania-Delaware border for decades (see graph). This made the river uninhabitable for fish, because they need dissolved oxygen as much as we need airborne oxygen.

The Delaware River Basin Compact established a commission that is empowered to “assume jurisdiction to control future pollution and [reduce] existing pollution.” In the late 1960s, the commission established clean-water standards and allocations for wastewater discharges to achieve these standards. These standards did not specify conditions that would permit the reproduction of resident and migratory fish and aquatic life.

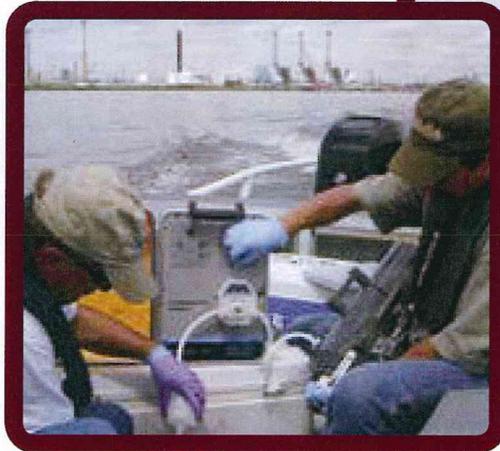
Rather, in this urban stretch of the river, the standards only provided for the survival of resident fish and the passage of migratory fish; a condition that does not meet the goals of the federal Clean Water Act.

By 1990, following construction of more advanced wastewater treatment plants, the commission achieved the standards established in 1967 (see graph). In 1979, a task force of fishery scientists appointed by the commission recommended dissolved-oxygen standards that would support the migration, spawning and use of this stretch as a nursery area for 27 fish species. Several scientific studies were conducted in the 1980s and 1990s to determine whether higher standards for dissolved oxygen could be established. These studies yielded two important conclusions. One was that discharges of nitrogen from wastewater treatment plants were depressing oxygen levels by up to two milligrams per liter, or about 20%. Another was that higher dissolved-oxygen standards were attainable.

This historic improvement in clean water contrasts starkly with declining dissolved-oxygen conditions in other major estuaries. Examples include Long Island Sound,



This graph shows how oxygen dissolved in the Delaware River at Philadelphia improved between 1965 and 2009. As you can see, the river was not capable of supporting much wildlife in the 1960s and '70s. It took until 1990 for dissolved oxygen to improve enough to support local and migrating fish.



Credit: Delaware River Basin Commission

Dr. Tom Fikslin (left) and Greg Cavallo (right) of the Delaware River Basin Commission use a pump to collect a water sample from the Delaware River off Marcus Hook, Pennsylvania in July of 2012.

Chesapeake Bay and the northern Gulf of Mexico. Since the 1990s, dissolved-oxygen levels have generally met the 1967 standards with occasional dips below the standards. This is especially true in the historically impaired portion of the river. During this same period, fishery scientists documented increases in the populations of, and reproduction by, important species. These include the American shad, striped bass and the endangered Atlantic sturgeon. Prompted by this evidence, scientists advising the Partnership for the Delaware Estuary have recommended that the Delaware River Basin Commission upgrade its uses of the river to include successful reproduction by important migratory and resident fish species.

The commission is currently finalizing a plan to address nutrient pollution (nitrogen and phosphorus) entering the estuary from direct, as well as indirect, sources. Indirect sources include the atmosphere and polluted runoff from agricultural and residential land that drains to the estuary. The plan includes initial steps to upgrade the current uses of the estuary to the existing uses, including the reproduction of important fish species. It includes actions such as measuring nutrients in the wastewater of industries and sewage treatment plants, the development of a new water quality model of the estuary, and assessing the role of nutrients in limiting the ecological health of the estuary. Implementation of this plan will ensure the continued improvement of the dissolved-oxygen levels begun in the 1960s. It will also achieve fish populations that are “optimal in size, species diversity and distribution,” as envisioned by the task force in the 1970s. ■

DRINK IT IN: The Craft Beer and

By Deanne Ross, Watershed Program Coordinator,
Partnership for the Delaware Estuary

Brewing craft beer is big business, here in the Delaware Valley and throughout the United States. According to the Brewers Association, craft brewers (defined as small, independent, and traditional) provide over 108,000 jobs with a retail value of approximately \$10.2 billion. In 2012, over 2,300 craft breweries churned out the suds for thirsty and enthusiastic American consumers.

In the 1600s, beer brewing followed early settlers across the Atlantic and up the Delaware and Schuylkill rivers. The industry grew steadily over the next 200 years with over 200 breweries and more kegs shipping out of the Philly seaport than anywhere else in the United States. Prohibition killed the brewing boom, and for many decades afterward people here had little choice other than mass-produced beers from other regions.

Jersey. A Google search of America's Top Beer Cities will show Philadelphia and its vicinity on almost every list.

So what makes a good beer? Some people like the bitter hops in pale ales, or a lighter lager. Others prefer the smooth malts of a dark porter, the coffee-chocolate taste of a stout, or perhaps the fruitiness of a lambic. Whatever your preferred brew style, about 90% of the liquid in your mug is water. Therefore, the availability of clean water from streams flowing into the Delaware River is a huge factor in making good, local brews. And beer from our region is not only good, it is also nationally recognized, awarded and distributed.

In Downingtown, Pennsylvania, the Victory Brewing Company sits on the East Branch of the Brandywine Creek because of the high quality and chemical composition of the water there. Annually, over 14 million gallons of the creek are brewed into beers that are sold in 30 states; this, according to the *Daily Local News*. Of particular note is Victory's Headwaters Pale Ale, a tribute to the streams that sustain the business as well as the flow of the Brandywine. Each bottle is labeled with information on the importance of our local waterways, and partial proceeds from its sale provide grant funds for organizations working on stream protection projects.

Along the Schuylkill, Kutztown's Saucony Creek Brewing Co. (SCBC) has a similar program with its newly released Stonefly IPA. Named after an aquatic insect that can only survive in clean water, proceeds from Stonefly IPA also fund stream protection projects.

Ben Franklin once said, "Beer is proof that God loves us and wants us to be happy." (I have a t-shirt that quotes him so it must be true.) They say Franklin was a very wise man, and now beer history seems to be repeating itself in our region. About two dozen craft breweries and even more specialty brew pubs, distributors and retailers are now operating throughout Pennsylvania, Delaware and New



Credit: Guardians of the Brandywine

Bill Covaleski (left) and Melissa Thomas (center) of Victory Brewing Company take a break with Amy Bruckner (right) from the Guardians of the Brandywine. Together, they and many others used a Headwaters Grant to plant 1,200 trees along the Brandywine Creek's Upper East Branch near Downingtown, Pennsylvania on April 15.

Clean Water Connection

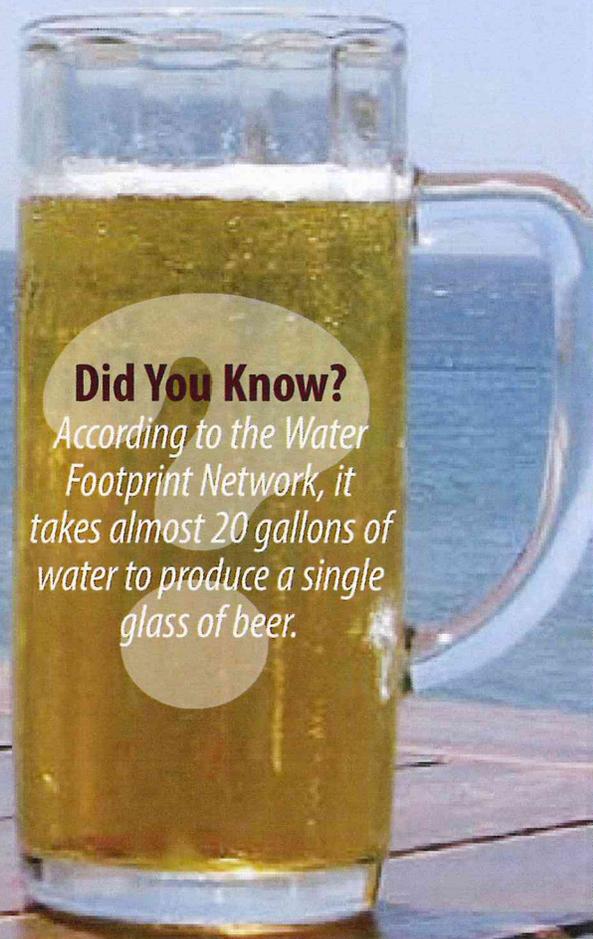
ects for organizations in the Schuylkill Action Network. SCBC beer coasters even carry the message that “keeping pollution from entering our water makes a healthier environment for all of us.” On June 7, a ceremonial keg of Stonefly IPA made its way down the Schuylkill via kayak to be enjoyed at a Beer Week event in Philadelphia.

This beers-for-the-environment philanthropy is alive and well in other parts of the region as well. Dogfish Head Craft Brewery in Milton, Delaware partners with The Nature Conservancy, raising tens of thousands of dollars for the organization each year at the popular Dogfish Dash. Both 16 Mile Brewery (Delaware) and Flying Fish Brewing Co. (New Jersey) have supported Delaware Bay oyster restoration efforts through the production and sale of hearty oyster stouts. And when the Partnership for the Delaware Estuary requests donated beers for fundraising events, local craft brewers are always

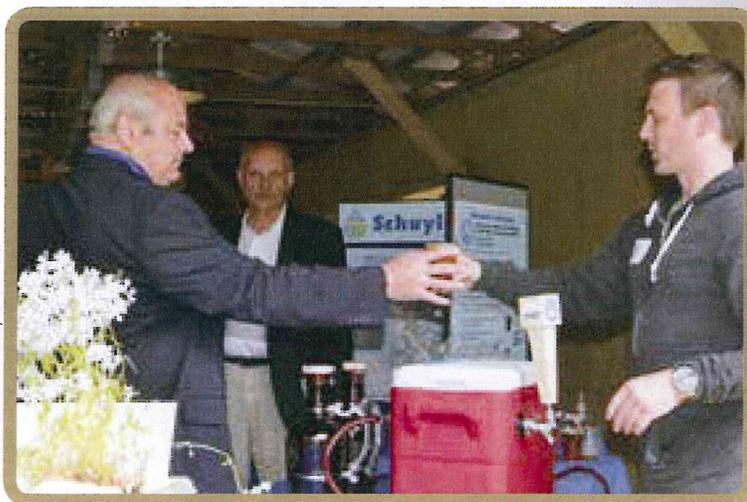
willing to offer their support.

On a national level, the Natural Resources Defense Council has launched the Brewers for Clean Water campaign, featuring protection of waterways as the basis for the robust economy of the craft brewing industry. Additionally, the Sierra Nevada Brewing Co. in California provides support for six river-conservation organizations in the United States each year through its “Wild Rivers” campaign, including the Delaware Riverkeeper Network.

Good beer comes from good water, which comes from good stewardship of water resources; a concept that is fully embraced by brewers of fine craft beers throughout the Delaware Estuary and United States. They know that healthy headwater streams help make this growing part of our economy possible. Surely Ben Franklin would’ve raised his glass to that. ■



Did You Know?
According to the Water Footprint Network, it takes almost 20 gallons of water to produce a single glass of beer.



Matt Lindenmuth (right) of Saucony Creek Brewing Co. hands samples of Stonefly IPA to attendees of the Schuylkill Action Network’s 10-year Anniversary Celebration on May 9 in Audubon, Pennsylvania. Members of the SAN used this to toast their partnership with the brewery, which will donate a portion of this beer’s profit for restoration projects.



Mariah Calagione (right) of Dogfish Head Craft Brewery presents Stephen C. Thompson (left), a trustee representing The Nature Conservancy’s Delaware chapter, with a check for the funds raised during the brewery’s 2011 Dogfish Dash in Milton, Delaware. Last September, this race netted the nonprofit over \$38,000.

Which Do You Think About More?

By David A. Sayers,
Supervisor, Delaware River Basin
Commission

Water

OR

Wi-Fi?

It's hard to over-emphasize the importance of clean water, yet we typically give it very little thought. This is because it seems to flow endlessly from our faucets at little cost. It's likely we spend more time thinking about who provides our TV, internet or cell phone service than how we get our life-sustaining drinking water supply.

The Delaware River Basin, or the land draining to the Delaware River and Bay, provides drinking water to approximately 15 million people, many of whom do not live within the basin's boundary. Over half

a billion gallons per day are sent from the basin to New York City and portions of northern New Jersey. According to the 2010 U.S. Census, of the basin's 8.3 million residents, approximately 6.8 million live in the Delaware Estuary Watershed, or the region draining to the tidal river and bay (i.e., from Trenton, New Jersey south to the bay). This is six percent more than in 2000.

HBO

Where do we get the water to quench the thirst of our growing population? The sources of our drinking water vary by region. However, approximately two-thirds of Delaware Estuary residents get their drinking water from surface-water sources, such as rivers and streams. The other one-third gets water from underground aquifers (ground water), typically hundreds of feet below the ground. In urban areas, it's more likely that drinking water originates from a surface-water source. It's also likely the water comes from a public water sup-

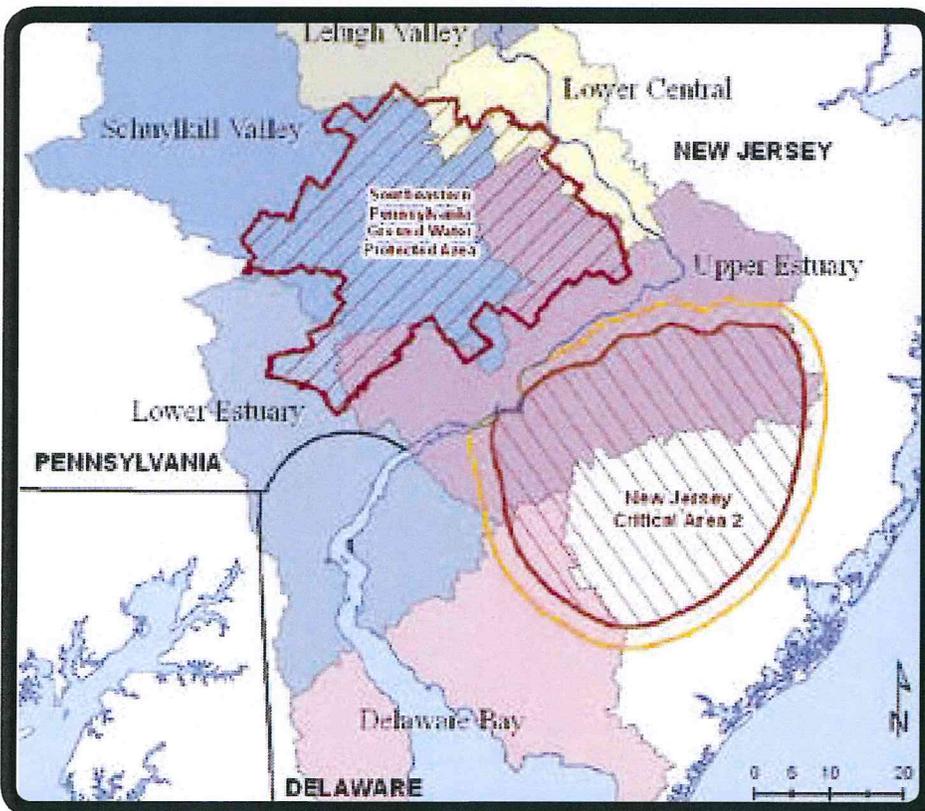
OR

H₂O?

ply system via a network of underground pipes. In the Delaware Estuary, almost 90% of residents get their drinking water from a public system. The remaining 10% get their water from their own domestic wells. The Philadelphia Water Department is the largest public water supplier in the basin and one of the largest and oldest in the country. Its water is pumped from both the Delaware and Schuylkill rivers. Through a distribution network of over 3,000 miles of pipe – enough to stretch from the East to the West coast – the water department delivers water to approximately 1.5 million residents and businesses in the city.

Occasionally, the demand for water and its availability do not align. The Delaware Estuary Watershed includes two major areas that are recognized as critical or pro-

This map shows the "New Jersey Critical Area 2," a region where there isn't enough groundwater for its growing population, so water must now be pumped from the Delaware River in Delran.



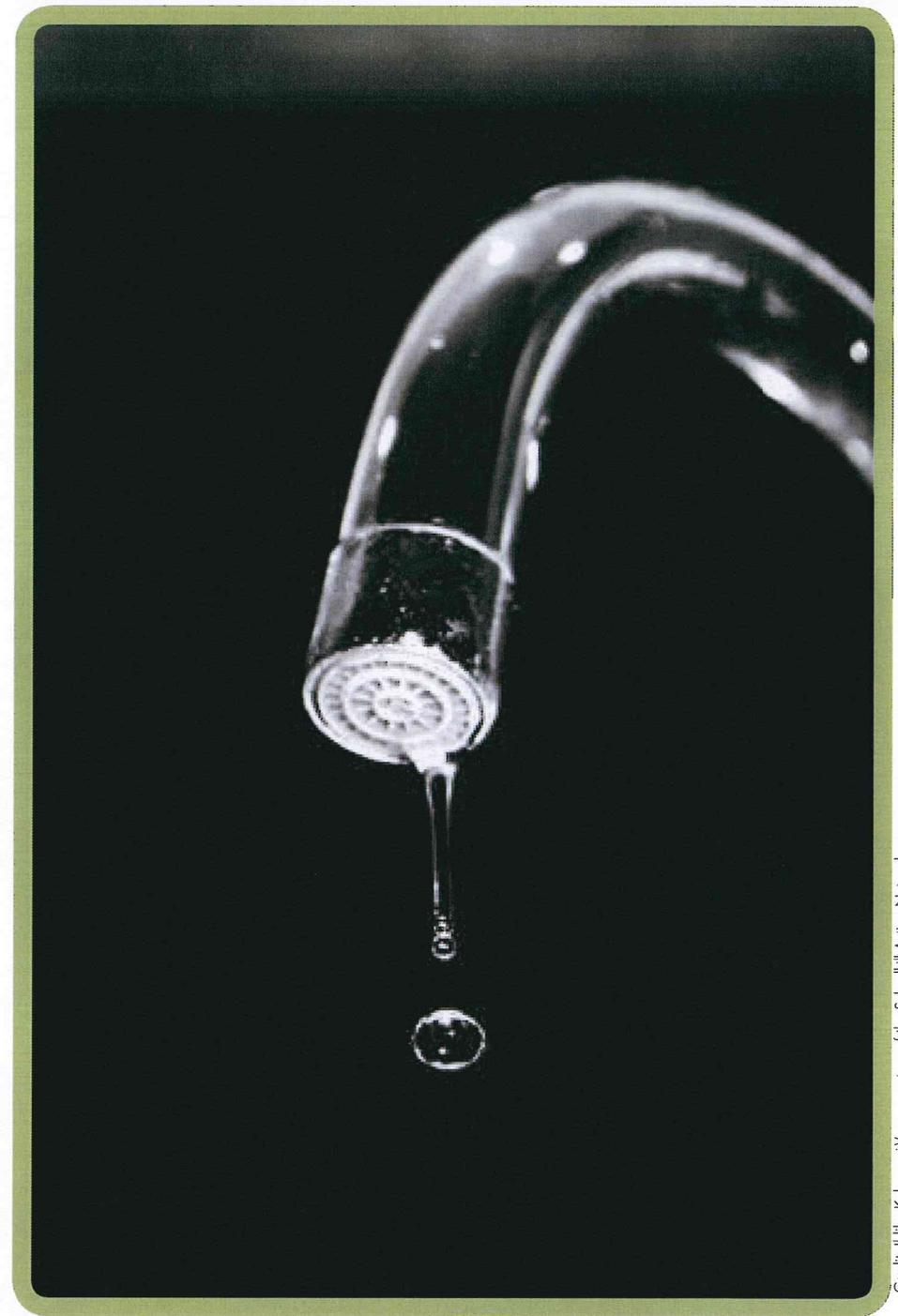
Credit: Delaware River Basin Commission

tected areas (see map) due to groundwater stress. In south-central New Jersey, home of the Pinelands, the New Jersey Critical Area 2 is a region that has traditionally relied on groundwater for its drinking water supply. However, population increases have put significant stress on the aquifers. To alleviate that stress, surface water from the Delaware River at Delran, New Jersey is now piped to many customers in the area to meet the increased demand for water.

Although the New Jersey Critical Area 2 is an example of a region seeing an increase in water use, this is actually more of an exception than the norm. The Delaware River Basin Commission tracks water use in the basin and has over 20 years of detailed data documenting water-use trends. Overall, the 40 largest public systems in the basin have shown a decrease in water use of approximately 15% over the past 20 years, despite an increase in population of around 13%. Why is this? While some of the decrease is a result of water-intensive, industrial customers leaving the region, a significant portion of the decrease is due to active water-conservation efforts. Customers are now using less water thanks to more efficient fixtures and fittings, better habits, and an increased awareness of the value of water. This has more than offset the increase in population over the same time period.

In addition to safeguarding the supply of water, how do we ensure the quality of the water we drink? Congress passed the Safe Drinking Water Act in 1974 to protect public health by regulating the nation's public drinking water supply. The U.S. Environmental Protection Agency, states and water-system owners work together to make sure that the appropriate standards are met. In 1996, Congress amended the act in several areas. These include providing more information to the public regarding the performance of public systems and a focus on source-water protection. Every state must conduct an assessment of its sources of drinking water. This way they can identify significant potential sources of contamination and determine how susceptible their water sources are to those threats.

Given all that is involved to obtain, treat, pressurize and distribute water, it is per-



Credit: Ildiko Kelenyest-Veres, courtesy of the Schuylkill Action Network

This photo won first place in the Tip Top Tap category of last year's Schuylkill Shots Photo Contest, which is hosted annually by the Schuylkill Action Network. Whether you get your water from a well or a supplier, you can enter now for a chance to win a \$250 gift card. Visit [Facebook.com/SchuylkillWaters](https://www.facebook.com/SchuylkillWaters) for details.

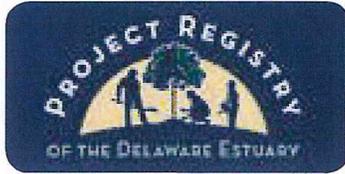
haps surprising that the average household only pays about \$40 per month to receive a clean, safe and reliable source of drinking water. As this issue of *Estuary News* is focused on the economic aspects of water, it is worth taking a moment to

compare this cost to the amount spent on digital entertainment. You will likely find that water, our most valuable resource, is a bargain in an era of booming costs among other utilities. ■

Annual List of Top Projects Un

By Priscilla Cole, Data and Information Specialist, Partnership for the Delaware Estuary

Project Registry of the Delaware Estuary



The Project Registry of the Delaware Estuary is an online tool used to collect and track restoration, enhancement, and conservation projects in need of attention. Free and open to the public, groups use the Project Registry to promote projects. Funders also use it to look for high-value activities in which to invest. The PDE uses the Project Registry to elevate the collective funding needs of the tidal Delaware River and Bay (Delaware Estuary) to regional and national funders. More than 150 projects are in the Project Registry, many of which are shovel-ready.

PDE Alliance

The Alliance for Comprehensive Ecosystem Solutions (PDE Alliance) is a collaboration of diverse public and private entities with an interest in protecting and enhancing the Delaware Estuary. The PDE Alliance selects an annual list of projects to support and promote based on experts' review of projects from the Project Registry. Qualifying projects must fulfill one or more priorities. These include tidal wetlands, urban waterfronts, forested riverside and headwaters areas, and shellfish or other signature species. The PDE Alliance also looks for a spread of projects across the four priorities and each of the three states of the Delaware Estuary. These include coastal Delaware, southern New Jersey, and southeastern Pennsylvania.

The membership of the PDE Alliance includes agency leadership from the U.S. Environmental Protection Agency, the State of Delaware, the State of New Jersey, the Commonwealth of Pennsylvania, the Delaware River Basin Commission, and the City of Philadelphia. Also on the PDE Alliance are leaders from the private sector. These include companies, foundations, and organizations with a long history of supporting restoration in the Delaware Estuary. Examples include DuPont, PSEG, the William Penn Foundation, the National Fish and Wildlife Foundation, the Delaware Riverkeeper Network, and the Partnership for the Delaware Estuary (PDE).

2013 Priority Projects

Horseshoe Crab/Shorebird Beach Restoration

The restoration of four sandy beaches along the shores of Delaware Bay in New Jersey will improve horseshoe crab breeding areas, thus benefitting red knot shorebirds, among others. A group of five organizations led by the American Littoral Society has already removed rubble and replenished sand at Reeds Beach, Cooks Beach, Kimbles Beach and Pierces Point. The team is now turning its attention to ensuring the sustainability of these restoration efforts, and expanding them to degraded beaches and marshes along the shores of Delaware Bay in New Jersey. Sediment is dredged from waterways to keep them navigable, and can sometimes be used to improve beach habitat for horseshoe crabs and help marshes keep pace with sea level rise.

South Wilmington Wetland Park

The City of Wilmington and others propose to use the Fingers-Gordon properties in South Wilmington to develop the Central Wetland Park. This will include recreational facilities and the restoration and/or enhancement of wetlands near the Christina River. The goal is to use restored and decontaminated wetlands to create a network of open spaces, swales, and ponds to promote natural flood retention and water restoration. Leaders of this effort will engage local residents to create environmentally sensitive and high-performance designs that will help solve flooding problems and be an asset to the community.



Credit: Priscilla Cole of the PDE

Re-introduce Mussels to Skippack Creek

The once-thriving freshwater mussels have gone locally extinct in Skippack Creek. However, scientists from The Academy of Natural Sciences of Drexel University and the PDE hope to reverse this trend. They have identified suitable habitat areas for reintroduction, and 50 animals will be tagged and released into two branches of the Skippack. These animals will be monitored over a 12-month period to assess their survival and health. This study will inform anyone considering potential,

large-scale reintroductions of freshwater mussels into Skippack Creek, and others, in the future.

Phoenix Park Restoration and Living Shoreline

The Camden County Municipal Utilities Authority purchased a former industrial site next to an existing wastewater treatment plant with the intention of turning it into a park. This site sits on the Delaware River with views of the Philadelphia skyline. Site designs include

veiled

"living shorelines," or those restored using local plants and shellfish, and kayak access. This ambitious project has caught the attention of environmental groups like the PDE, The Nature Conservancy, and a new Urban Waters federal partnership for its potential to reconnect the local community to the Delaware River.

Peters Creek Restoration

At a park next to Peters Creek in New Jersey, the Delaware Riverkeeper Network seeks to install a combination of plants, trees, and soils designed to allow the ground to absorb the first inch of rain and melting snow from nearby pavements. This will prevent pollution from reaching the native fish and wildlife living along the creek, and it will restore 500 square feet of eroded land. It will widen a narrow, forested strip along the creek to be at least 50 feet wide. Over 100 volunteers will be needed to help with the project, and this will raise awareness about the importance of "green infrastructure" (like plants and trees) for clean water.

Phase 1 began in 2012, including conceptual planning and topographical surveying.

Neshaminy State Park Wetland

The project site in Neshaminy State Park contains some of the highest-quality freshwater tidal wetlands on the Pennsylvania side of the Delaware River north of Philadelphia. This wetland site is intermittently fed by an undersized "culvert," or roadside drain. However, this often clogs, limiting tidal water flow. The Pennsylvania Environmental Council proposes to enhance the wetland by removing the culvert opening altogether. It will then consider replacing the culvert with a pedestrian bridge crossing.

For more information about the PDE Alliance and its Project Registry of the Delaware Estuary, please contact Priscilla Cole at (800) 445-4935, extension 115. ■

The Delaware Riverkeeper Network is seeking almost \$500,000 to restore a portion of Peters Creek in Audubon Park, New Jersey. Otherwise, polluted runoff from roads and parking lots will continue to run off into this tributary of the Delaware River.



Credit: Delaware Riverkeeper Network



The Camden County Municipal Utilities Authority needs up to \$750,000 to restore the former American Minerals site located on the Delaware Riverfront. The utility has already accomplished all of the demolition and permitting needed to turn it into a park with both waterfront access and wildlife habitat. All it needs now is funding.

Credit: Camden County Municipal Utilities Authority

A front-end loader adds sand to Kimbles Beach near Cape May Court House, New Jersey on April 5. Five organizations have partnered together to seek funding for the preparations needed to replenish additional bayshore beaches.



Credit: Dr. Larry Nilles

Members of the PDE Alliance continue to seek support for the Priority Projects listed below from previous years:

- Bridesburg Urban Waterfront Restoration (PA)
- Identifying Juvenile Red Knot Wintering Areas (Estuary-wide)
- Delaware Bay Oyster Restoration (NJ, DE)
- Project Ports: Promoting Oyster Restoration Through Schools (NJ)
- Assessing Submerged Aquatic Vegetation in the Delaware Estuary (Estuary-wide)
- Penn Treaty Park Wetlands (PA)
- Cresheim Creek Dam Modification (PA)
- Delaware Estuary Living Shorelines (DE, NJ)

New Jersey Entering a Wine



Credit: Dr. Gary Pavlis of Rutgers University Cooperative Extension

These grapes at the Cape May Winery are rooted just two miles from Delaware Bay. This location is ideal given its sandy soil, mild climate, and accessibility via the nearby Cape May-Lewes Ferry terminal. You can even enjoy a Marine Naturalist Program during your sail.



Credit: Dr. Gary Pavlis of Rutgers University Cooperative Extension

Grapes belonging to Natali Vineyards grow just a half-mile from Delaware Bay and two miles from New Jersey's Cape May National Wildlife Refuge. This makes its tasting room a nice place to sip wine while watching migratory birds fly overhead in the spring and fall.

Who would have guessed that when the New Jersey legislature passed the Farm Winery Act 32 years ago it would ignite a renaissance of the wine industry in this state? Before that piece of legislation, a law was still on the books initiated during Prohibition that stated there could only be one winery per million people based on the state's population. The time was 1981 and there were seven wineries. We now have over 50. There are numerous factors that brought about this seven-fold growth. Realize that the wine industry is the fastest growing segment of agriculture in New Jersey, by far. So why this growth? The reasons are social, economic, and climatic.

Socially, this state and this country are becoming a wine loving-region much like that of Italy, France and Germany. We drink wine with our meals on a regular basis and, two years ago, wine actually surpassed beer as our number-one alcoholic drink. Wine has become a passion for many, and this passion and love for wine develops into the desire to produce it.

Economically, growing grapes became the crop of choice in a difficult economy. Other, less profitable crops were no longer paying the bills. A \$200-per-acre return for corn doesn't stack up to a \$6,000 return for merlot grapes on that same acre. Many farmers growing corn, lima beans, hay, apples and peaches have come to me wanting to know how to grow grapes.

And climatically, New Jersey has, in my opinion, the best climate for growing grapes in the East. Our well drained soils, long growing season, mild winter temperatures and access to clean, quality water for irrigation all give this state a tremendous advantage for quality grape growing. And, interestingly enough, as you travel from the vineyards of Sussex County in the north to those in Cape May County in the south, the grape varieties change with the climate. In the north, it is cooler and so grapes such as riesling and pinot noir are doing very well. One winery won an award for the best riesling in North America in a competition. In the south, the hot weather grapes are their forte. Cabernet sauvignon, merlot, and even some Italian varieties

Renaissance

By Gary C. Pavlis, Ph.D., Professor/Atlantic County Agricultural Agent, Rutgers University Cooperative Extension



Credit: Nicole Marie Edline, or Flickr user nme421

The Lorita Winery in New Egypt, New Jersey sits on 40 acres near the headwaters of Crosswicks Creek, which drains to the Delaware River in Bordentown. The 10-year-old winery prides itself on sustainable practices, like solar power, water conservation, and reclaimed building materials.

such as sangiovese, barbera, and nebbiolo are thriving.

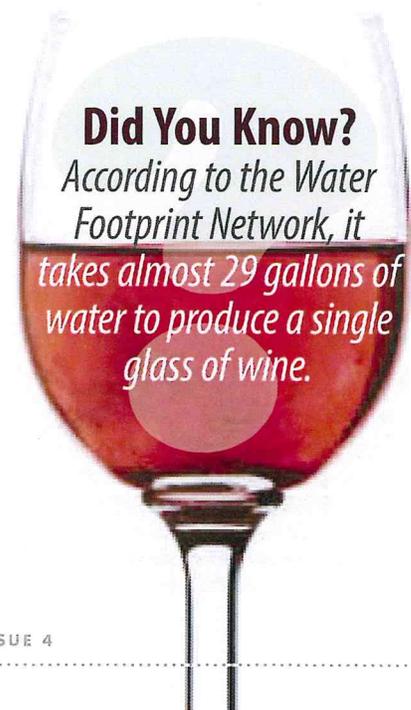
So the reader now must ask, how are the wines? It is true that 15 to 20 years ago, all the wines made in New Jersey were sweet and simple. That has changed and it should be realized that New Jersey has a long history of wine making. In 1767 the Royal Academy in Great Britain awarded two wines produced in New Jersey with their highest award as the best wines produced in the New World. This was the beginning of the New Jersey wine industry. In the early days, wineries grew Concord, Niagara and Delaware grapes. With time, varieties such as Seyval, Vidal and chambourcin were added, which are French hybrids. As wine drinkers became more sophisticated in their wine drinking, vintners grew cabernet sauvignon, chardonnay and riesling in many parts on this state. But what is our best grape? Is it cabernet, merlot, or some other variety? The New Jersey wineries are still experimenting.

A recent survey conducted by Rutgers University revealed that there are currently 82 grape varieties being grown in this state. With time, many of these will be taken out for numerous reasons, such as lack of winter hardiness, poor wine quality, or susceptibility to diseases. Most wineries do not expect to find a perfect grape to make one and only one wine. They have found that producing a range of wines is very consumer friendly. To that end, many also produce fruit wines made from blueberries, cranberries, cherries or various other fruits. Some consumers may confuse this fruit-wine production with the inability to produce a quality dry wine. The production of the one does not diminish the production of the other. In fact, we make some of the best fruit wines in the country. Try a New Jersey red-raspberry wine with cheese cake for dessert and you will know what great food and wine matching is all about.

As far as quality dry wines are concerned, I'm here to tell you that New Jersey has

arrived. Some time ago I saw an article about New Jersey's wine industry entitled "Napa East." I think it would be more accurate to call our wines, our wine styles, and our industry, "Bordeaux West." Our climate results in wines that are more European in style; namely, less tannic, lower alcohol, and more food friendly. It is also interesting to note that when our wines are judged against the best of France, as was done last summer at a tasting in Princeton, entries were deemed as good or better than the French entries, which were, by the way, in the \$200 to \$800-per-bottle range.

Not every wine produced in New Jersey is on the level of a Chateau Mouton Rothschild Bordeaux, but that is true with wine from anywhere in the world. New Jersey wines will continue to improve and I challenge the reader to go out and experience the passion that is the New Jersey wine industry. What you will find is a wide range of wine types and styles, and wines that will satisfy the tastes of just about any wine drinker. Crisp whites, lush and fruity reds, gorgeous fruit wines, rich ports and beautiful dessert wines are all offered by New Jersey's wineries. ■



Delaware Bay's Bounty: COMMERCIAL FISHING IN



An artist's mural commemorates Philadelphia's Fishtown neighborhood as the former hub of the Delaware River's shad-fishing industry.

The Delaware Estuary Watershed, or the land draining to the tidal Delaware River and Bay, generates over \$10 billion annually; this for a region with the seventh-largest metropolitan economy in the United States. This income is derived from industries that depend on the environment. Examples include water suppliers, agriculture, parks and recreation, maritime transportation, and fishing and hunting.

A Storied Past

The commercial fishing industry in particular boasts a long and profitable history in the estuary. At the end of the 19th century, the Delaware Estuary supported the largest commercial American shad and sturgeon fisheries along the Atlantic coast. By the 1880s, about 1,400 sailing vessels were harvesting 22 million pounds of oysters a year from the Delaware Bay. And in 1896 alone, watermen caught over 14 million pounds of shad worth \$400,000 (over \$10 million in 2013 dollars).

Today, the estuary is home to over 200 species of resident and migrant fish and shellfish. Commercial fish landings contribute \$34 million annually to our region's economy. Many of these fisheries provide

us with the seafood that ends up on our dinner plates, such as blue crabs, summer flounder, oysters, and striped bass. Ordering these fish injects money into our local economy and supports an industry that has grown with cleaner water in the estuary.

Pennsylvania

The watershed draws 35% of its population from Pennsylvania despite occupying only 7% of its land area. Not surprisingly, the Pennsylvania region of the watershed contributes the least in terms of the landed weight and value of its fisheries. However, this was not always the case. In the late 1800s and early 1900s, the Delaware River,



ABOVE: Caviar makers and fishermen pose for a photograph on the deck of their packing house floating in the Delaware Bay off Caviar, New Jersey circa the 1890s or early 1900s. This boomtown was located at the mouth of Stowe Creek in Cumberland County, where Atlantic sturgeon were once plentiful.



LEFT: Fishermen slice open three Atlantic sturgeon for their eggs on the docks of Caviar, New Jersey in 1923. Like the fishery, this town no longer exists, but it could again with careful management of the species.

THE ESTUARY

By Matthew Speiser, Communications Intern,
Partnership for the Delaware Estuary

from Delaware City, Delaware, to Roebing, New Jersey, was home to one of the largest juvenile Atlantic and shortnose sturgeon populations in the world. This was due to the species' tendency to spawn in freshwater, temperate climates.

The roe (eggs) of these sturgeon produced high-quality caviar. During the "caviar craze" from the late 1800s to the early 1900s, greater Philadelphia found itself at the center of this sturgeon population. Needless to say, a significant commercial fishery developed with annual harvests approaching 7 million pounds nationwide. Unfortunately this boom was short lived due to overharvesting and the sturgeon population has been in decline ever since the early 1900s. Today the yellow perch is the most profitable fishery in Pennsylvania with a landed value that exceeds \$70,000 annually. Meanwhile, the Atlantic sturgeon has a long road to recovery. It has joined the shortnose sturgeon on the endangered species list. However, the sturgeon fisheries at the turn of the 20th cen-

tury will always represent the Pennsylvania fishing industry at its prime.

Delaware

Unlike Pennsylvania, Delaware's fisheries have a much more profound impact on our current local economy. In 2011, watermen harvested over 3.5 million pounds of blue crab in the Delaware River and Bay for a landed value of close to \$5 million. A staple of the Mid-Atlantic, the blue crab is renowned particularly for its health benefits. Believe it or not, three ounces of steamed blue crab contains 90 calories and only one gram of fat, making it one of the healthiest food choices available locally.

Historically, Delaware's blue crab harvests have fluctuated dramatically. These range from under a quarter-million pounds in 1968 to over 7.5 million pounds in 1995. However, over the past five years, harvests have consistently produced at least 3 million pounds of blue crab. This is important in a country where the average person will eat

over a half-pound of crab per year, making crab the eighth-most consumed seafood in the United States.

New Jersey

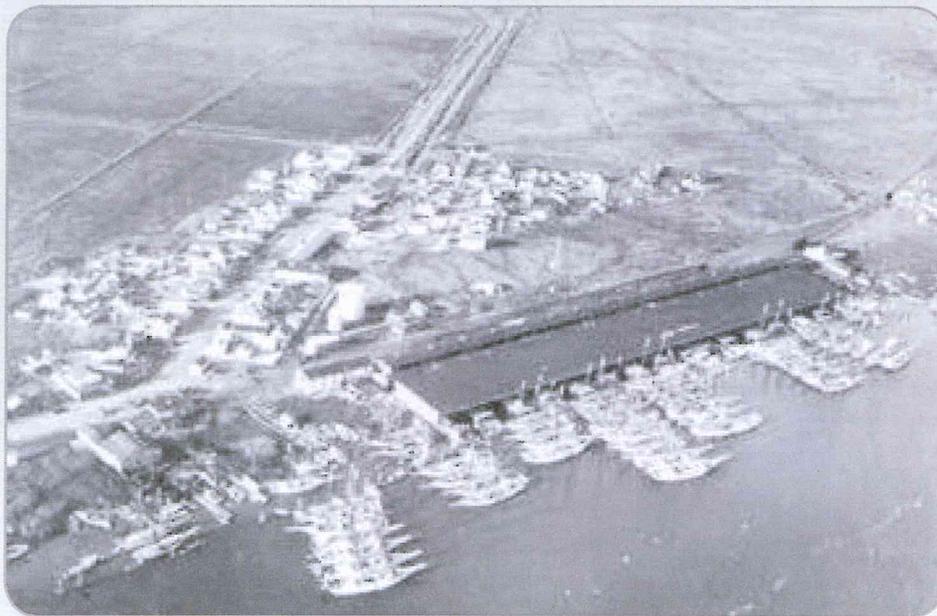
New Jersey boasts the largest commercial fishing industry in the region, despite sharing only 26% of its land area with the watershed. In fact, four of the top-ten fishing ports in the Mid-Atlantic are located in New Jersey, including the port of Cape May-Wildwood, which produces upward of \$80 million annually in landed value. New Jersey fisheries contribute more landed weight and value than Delaware and Pennsylvania's combined; although, many were impacted by Hurricane Sandy.

Popular species native to the Delaware Estuary waters of New Jersey include the blue crab, shad, striped bass, summer flounder, and bluefish. In recent years, the blue crab has been the most profitable fishery. Commercial crabbers hauled in over 9 million pounds in 2010 and 2011 in the Garden State (with about half that catch in the Delaware Estuary) after never having a season's catch of more than 8 million pounds since 1950. This netted them an average of around \$5 million per year from the Delaware Estuary in New Jersey.

The summer flounder, also known as "fluke", has been the model for consistency among New Jersey fisheries. This is because every season has yielded at least a million pounds in landed weight dating back to 1950. However, the Atlantic States Marine Fisheries Commission reduced the limit of summer flounder caught this season by 15%, due to a lack of spawning stock.

Atlantic menhaden is the third-most profitable species in the New Jersey waters of the estuary. This fishery generates almost \$3.2 million annually in landed revenue. Then there are eastern oysters, which gave rise to

continued on page 14



The year is 1928 and over 40 schooners are docked outside the shipping sheds in Bivalve, New Jersey; so named because of the port's booming oyster industry.

Delaware Bay's Bounty continued from page 13

the bayshore towns of Bivalve and Shellpile. Oystermen dredge up about a half-million pounds of these per year, which are valued at over \$2.5 million – before they ever leave the docks.

Commercial fishing, much like the estuary itself, is a complex system that is forever changing. Many jobs – from the anglers all the way to the wholesalers – depend on the living marine resources in the estuary. Then there are all the industries related to commercial fishing, such as bait and tackle shops, marinas, and hundreds upon thousands of seafood restaurants, all of which employ cooks, servers and more. Commercial fishing is an economic machine that generates millions of dollars and is only one of many ways that the estuary helps our region prosper. Consider that the next time you crack into that bucket of crabs! ■

Top 10 Seafood Products

1. Blue crabs:\$10.8 million
 2. Summer flounder:.....\$4 million
 3. Atlantic menhaden:.....\$3.2 million
 4. Eastern oysters:.....\$2.7 million
 5. Striped bass:.....\$1.7 million
 6. American Eel:.....\$625,500
 7. Atlantic herring:.....\$563,000
 8. Whelk:.....\$511,200
 9. Bluefish:.....\$508,100
 10. Weakfish:.....\$261,200
- Industry Total: \$25.4 million**

Sample Local Seafood

Every June:

DELAWARE BAY DAY
in Bivalve, NJ

HARBOR FEST
in Cape May, NJ

Every August:

BIG THURSDAY
in Bowers Beach, DE

COHANSEY RIVERFEST
in Bridgeton, NJ

Every October:

DELAWARE COAST DAY
in Lewes, DE (see page 15)



Credit: Shaun Bailey of the PDE

Pennsylvania Coast Day

September 7, from Noon to 5 p.m.

Philadelphia, PA

Discover Pennsylvania's coastal connection at Pennsylvania Coast Day, hosted by the Partnership for the Delaware Estuary (PDE). Attractions at Penn's Landing will include boat rides, kayaking, kids crafts, face painting, swan boats and more. Dive in to DelawareEstuary.org for details, or call (800) 445-4935, extension 112.

International Coastal Cleanup

September 21

Worldwide

Last year more than half a million volunteers collected over 10 million pounds of trash during the International Coastal Cleanup. You can join this worldwide movement in a community near you. Simply visit DNREC.Delaware.gov/CoastalCleanup for details in Delaware, NJClean.org for news in New Jersey, and <http://bit.ly/14Ln88x> for plans in Pennsylvania.

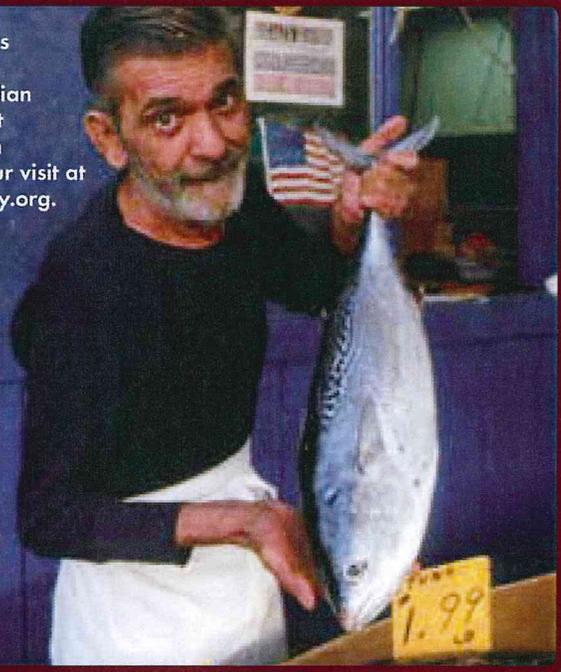
Hayride & Beer Tasting

September 28, from 6 to 10 p.m.

Wilmington, DE

The PDE is teaming up with Bellevue State Park and Peco's Liquors for the Great Pumpkin Debate and Hayride. Enjoy a fall hayride through Bellevue State Park and sample pumpkin beers at the barn. Proceeds will benefit the PDE's work in the nearby Brandywine River, Delaware River and beyond. Call Peco's Liquors at (302) 764-0377 for tickets, or e-mail KForst@DelawareEstuary.org for information.

A vendor display's the day's catch in Philadelphia's Italian Market, the oldest outdoor market in America. Plan your visit at ItalianMarketPhilly.org.



Credit: B. Krist for the Greater Philadelphia Tourism Marketing Corporation

Credit: Matt Urban of Mobius New Media



Experience the Estuary Celebration

**October 3, from 5 to 8:30 p.m.
Philadelphia, PA**

Join the PDE and its many supporters at the annual Experience the Estuary Celebration. This year's dinner and auction will take place overlooking the tidal Delaware River at the Independence Seaport Museum on Penn's Landing. Sponsorships are still available and auction donations are still needed. Visit DelawareEstuary.org for info, ticket prices, and sponsorship rates, or call (800) 445-4935, extension 101.

**Featured on
ecoDelaware.com
Delaware Coast Day**

**October 6,
from 11 a.m. to 5 p.m.
Lewes, DE**

Stop by the PDE's booth at Delaware Coast Day, just steps from Delaware Bay. Visit DECoastDay.com to see how you can meet wild animals, taste seafood, tour ships, rediscover gardening, and interact with scientists in their labs. Call (302) 831-8083 for details.



Credit: Kathy Atkinson of the University of Delaware

Old City Seaport Festival

**October 11-13
Philadelphia, PA**

See Philadelphia like its founders did, from the deck of a seagoing ship, during the three-day Old City Seaport Festival. The PDE will be there on Saturday to help interpret the Delaware River, the largest freshwater port system in the world. Log on to PhillySeaport.org/SeaportFestival for info, or call (215) 413-8655.

**Featured on
ecoDelaware.com
Blackbird Creek Fall Festival**

**October 19,
from 10 a.m. to 4 p.m.
Townsend, DE**

Surround yourself in autumn colors as you enjoy free hikes, hayrides, live music, kids crafts and more on the banks of Blackbird Creek. The PDE will be among the many exhibitors on hand. Visit <http://1.usa.gov/pA8i1A> for details, or call (302) 739-3436.

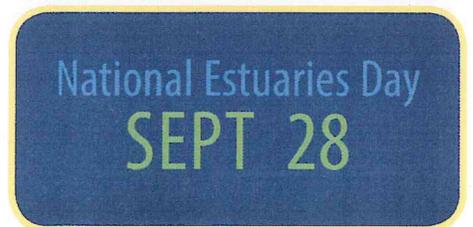


Credit: The Delaware Nature Conservancy

**Featured on
ecoDelaware.com
See You Outside Challenge**

**Ends November 5
Throughout Delaware**

You could win a great prize by participating in the See You Outside Challenge. All you have to do is complete 10 to 30 outdoor activities in Delaware. Visit SYODelaware.org for a list of options, rules, and to sign up today. ■





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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, a National Estuary Program, leads science-based and collaborative efforts to improve the tidal Delaware River and Bay, which spans Delaware, New Jersey, and Pennsylvania. 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.

Partnership for the Delaware Estuary, Inc.

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