



estuary news

Newsletter of the Delaware Estuary Program

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Summer 2001

Exploring the Estuary

By Kathy Klein & Joseph Matassino, Partnership for the Delaware Estuary

In celebration of the summer months, this issue of *Estuary News* highlights a number of fascinating waterfront destinations that are located within the Delaware Estuary Region. We hope that you will find time over the next few months to visit a few of these sites — from the tiny maritime museums to the vast open spaces of the Estuary's numerous wildlife preserves. We also encourage you to visit the urban waterfronts in our area, many of which are currently undergoing enormous and exciting transformations from industrial landscapes to tourism destinations.

Historically, major alterations to the Estuary's shoreline, particularly north of Wilmington, Delaware began as early as the colonial period. Tidal marshes were filled to accommodate agriculture. Shorelines were extended into the river to create suitable port facilities at Wilmington, Philadelphia, Burlington, and Trenton. In the 19th Century first the canals, then the railroads, took the route of least resistance along the river shoreline. Easy access to transportation and a plentiful water supply spurred industrial development along those same river corridors. Throughout the 19th Century, the region's population grew by leaps and bounds, and by century's end, the Philadelphia region was *the* major industrial area in the United States, with two of the countries largest shipbuilders. All of this development physically changed the face of the Estuary; it also exacted a terrible price on the Estuary's water quality. For much of the 20th Century, both the Delaware and Schuylkill Rivers ran as open sewers into the Estuary. Water-borne disease was common and nearly all the Estuary communities turned their back on their riverfronts making them inaccessible and undesirable.

In the 21st Century, much has changed. A large segment of the industry that lined the banks of our rivers has disappeared, leaving behind skeletal structures as present day reminders of our region's past. As a result of the 1972 Clean Water Act, the Estuary's water quality has greatly improved causing people to think differently about the urbanized reaches of the river. We are now experiencing a waterfront renaissance that is turning empty warehouses into luxury waterfront condominiums, converting brownfield sites into green park spaces, and constructing shopping malls and baseball fields, all with a river's view. The major cities in our region — Philadelphia, Camden, Trenton and Wilmington — are in the midst of huge waterfront redevelopment initiatives.

For the first time in many years, the public is gaining greater access to the Delaware and Schuylkill Rivers. Boat ramps, riverfront parks, and events are providing venues that enable people to get close to the river, to get on the water, and to learn

about how they are connected to the Delaware Estuary. It is the educational opportunities that we are especially excited about. We are encouraging those orchestrating waterfront redevelopment to think beyond the shopping mall, and to design these projects as ones that provide a truly holistic experience that highlights the history, flora and fauna, and the environmental progress and challenges that we still must address. We also hope that these developments will implement Best Management Practices, employing the latest technologies.

We are especially excited about the progress that has been made on the Christina riverfront in Wilmington, Delaware. In addition to shops, restaurants, an arts center, and a baseball field, that is home to the Wilmington Blue Rocks, there is walking trail along the river's edge and planning is underway to establish the Russell W. Peterson Urban Wildlife Refuge. This 225 acre refuge will be fully restored as habitat for migrating waterfowl and other wildlife. An extensive rehabilitation effort will include shoreline stabilization, the re-excavation of water channels, and the installation of wildlife nesting structures.

Regardless of where you go to explore the Estuary this summer, we encourage you to take full advantage of this newfound access to the river's edge. And when you are out there, ask yourself: What species of fish are swimming underneath the water's surface? Are they healthy to eat? What has been industry's role in shaping the character of our waterways? How is recreation being integrated into a working waterfront? Are the uses compatible? Finally, ask yourself what you can do to help improve water quality on a daily basis.

We are optimistic that with greater access to the Estuary will come enhanced stewardship for our region's waterways, improving the quality of life for all living creatures in the Delaware Estuary.



updates from del ep

In Honor of Bob Knecht

By Forsyth P. Kineon, Director, Delaware Estuary Program

Recently the Delaware River Region and the entire world suffered a tremendous loss. Robert W. Knecht, co-director of the University of Delaware Center for the Study of Marine Policy for the past 12 years, died on Sunday June 3, 2001. Bob was born 73 years ago in Ogdensburg, New York. His life spanned several careers and numerous miles.

Professor Knecht has had a long and distinguished career in public service and marine policy. Originally trained as a physicist, he served as Deputy Director of the Environmental Research Laboratories in Boulder, Colorado. He held office for three terms as the mayor of Boulder, from 1965 to 1971. After studying marine affairs at the University of Rhode Island, he was appointed the first director of the Coastal Zone Management Program of the National Oceanic and Atmospheric Administration (NOAA) from 1972 to 1979. In this capacity, he supervised development and federal approval of the first state coastal zone management plans, and played a key role in establishing the National Estuarine Research Reserve System.

Bob was a Special Representative of the Secretary of Commerce to the negotiations on the United Nations Convention on the Law of the Sea. In this capacity, he developed and negotiated positions on the international management of seabed minerals. In 1980 and 1981 he was Director of the Office of Ocean Minerals and Energy at NOAA, where he supervised the implementation of federal legislation governing deep seabed mining and ocean thermal energy conversion. Professor Knecht also consulted to a variety of organizations involved in coastal resources management.

In an international capacity, Bob consulted to the World Bank, collaborating on the preparation of guidelines for integrated coastal management and provided training and advice on coastal management to a dozen countries. He most recently served as Vice President of the International Coastal and Ocean Organization and was a member of the Marine Area Governance Committee of the Marine Board of the National Research Council.

As an author, Bob was co-editor in chief for the international journal *Ocean & Coastal Management* for many years. He co-authored two books, the most recent is entitled *The Future of U. S. Ocean Policy: Choices for the New Century*, a blueprint for ocean policy reform in the United States. He has also written or co-authored more than 75 publications on a wide variety of coastal and ocean resource management issues.

Among his many awards and honors, Bob had the Science and Research component of the Delaware Estuarine Research Reserve dedicated to him on January 26, 2001. Additionally in 1999, Bob received the Julius A. Stratton Leadership Award, a national award that earned him the title "Champion of the Coast."

When someone hears the name Robert Knecht, many descriptions come to mind: a policy maker, an educator, a scientist, a statesman, and a family man. Often times these roles are intertwined, and examples of each area have been given earlier in this article. However, the role of educator needs to be emphasized. Many of his students have mentioned that Bob was a professor who was clear, succinct, drove the point home and genuinely cared. His students, who can be found in science, Congress, many levels of government and the non-profit world, will represent his ideas nationally and internationally for decades to come. From Bob's positions as a high-level administrator, international policy-maker, physicist, mayor, teacher, father, husband and friend; perhaps the best way to describe him is as a Renaissance man.

I was fortunate enough to have known Bob for the past ten years. Our interaction began while I was working for NOAA's Coastal Management Program, for which Bob was consulting on many projects. This interaction then continued at national conferences, and in the past two years became more of a personal one, most notably strategizing on the best way to help the resource in our own back yard, the Delaware Estuary. The last time I saw Bob was at the Delaware Estuarine Research Reserve in January 2001. The last thing he said to me was that we are going to make the Delaware Estuary Program really work well, and bring the Estuary to a higher ecological level of health.

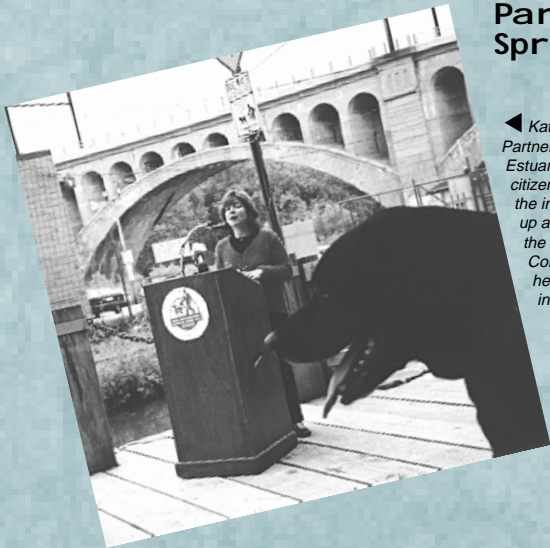
Bob's funeral was held at St. John's Church in Washington, DC, across from a large white house located at 1600 Pennsylvania Ave. It seems ironic that a man of international acclaim was laid to rest in our nation's Capitol. He also has a good view of the White House, and perhaps will keep an eye on the leaders of our country for years to come. The service was attended by many family and friends and consisted of many hymns, stories from family and friends, and ended with everyone singing America the Beautiful. This was a fitting song for someone who has had such a profound influence on the beauty of America's coasts and estuaries.

Bob has had a profound effect on his peers, his students, the region and the world. His wife and collaborator in Marine Policy, Bilianna Cican-Sain, four children, two brothers and a sister survive him.

In lieu of flowers, donations may be made to the Colon Cancer Alliance or to the Robert W. Knecht Marine Policy Fellowship Fund (Colon Cancer Alliance, Inc., 175 Ninth Avenue, New York, NY 10011, 212-627-7451; Robert W. Knecht Marine Policy Fellowship Fund, c/o Catherine Johnston, Center for the Study of Marine Policy Graduate College of Marine Studies, University of Delaware, Newark, DE 19716-3501, (302) 831-8086 (checks made payable to the University of Delaware)).

Making Waves

Partnership for the Delaware Estuary Spring 2001 Photo Album



◀ Kathy Klein of the Partnership for the Delaware Estuary speaks to reporters, citizens, and canines about the importance of cleaning up after our pets during the Manayunk Dog Waste Collection Kick-off event held on May 22, 2001 in Philadelphia.



▲ Mayor James Baker of Wilmington greets Bancroft Academy students at the Wilmington Storm Drain Marking Kick-off event held on April 27, 2001.

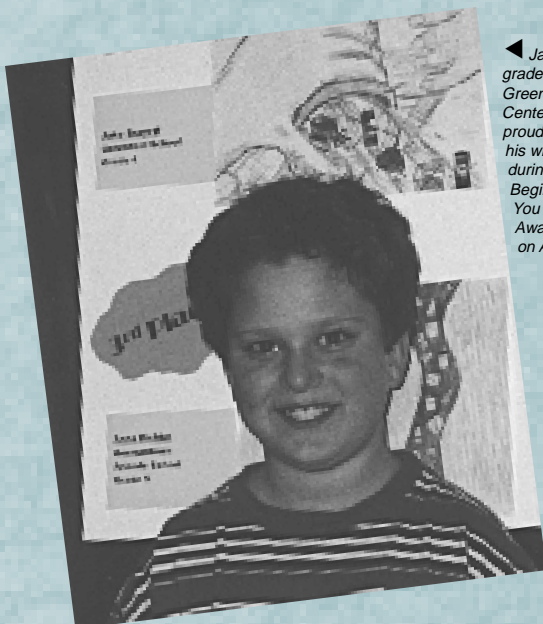


▲ Students from Philadelphia's Fulton Elementary School anxiously wait their turn to mark the first storm drain in the Earth Day 2001 Philadelphia Storm Drain Marking Project held on April 12, 2001.



▲ A Pet Waste Collection message found inside DART buses throughout New Castle County, Delaware this spring.

▼ PG&E, a participant in the Corporate Environmental Stewardship Program, restoring habitat on June 15, 2001, at the Logan Generating Station in Swedesboro, New Jersey.



◀ Jake Shayer, a fourth grade student at the Greenfield School in Center City Philadelphia, proudly poses in front of his winning artwork during the Clean Water Begins and Ends with You Drawing Contest Awards Ceremony held on April 10, 2001.

TIDINGS: News from around the region

Fairmount Water Works poised to become, once again, a Destination for Visitors from around the World

By Ed Grusheski, General Manager of Public Affairs,
Philadelphia Water Department

On April 26, 2001, U.S. EPA Administrator Christine Todd Whitman (former Governor of New Jersey) joined Philadelphia Water Commissioner Richard Roy in presiding over the groundbreaking ceremony that marked the beginning of construction on the ambitious expansion of the Fairmount Water Works Interpretive Center (FWWIC). Please see map on page 11 for the location of the FWWIC.

Since 1992, the Philadelphia Water Department has operated the FWWIC in the unfinished spaces of the historic Fairmount Water Works. Between 1992 and the end of last year, more than 100,000 students, scholars, residents, and tourists had visited the center to participate in its programs and to be educated about water in the urban environment. The finished facility will be able to accommodate up to 100,000 visitors annually. For the past three years, the center has been a destination of the Delaware Estuary Teacher Education Institute sponsored by the Partnership for the Delaware Estuary.

"The new Interpretive Center will play a key role in helping visitors understand the importance of proper stewardship of Philadelphia's precious water resources. It will also reinforce for us today the wisdom of those who built the Fairmount Water Works almost two centuries ago — that through the proper and creative use of technology, we can use nature's resources for society's benefit without harming those resources".

— Governor Christine Todd Whitman, U.S. EPA Administrator,
The Fairmount Water Works Groundbreaking Ceremony,
April 26, 2001

Scheduled to open on Earth Day 2002, a National Historic Landmark, FWWIC will feature an Urban Watershed exhibit, a Delaware Estuary exhibit, a water lab, an audio-visual theatre,

and an environmental technology center. In addition, interactive displays will interpret the extraordinary history of the Fairmount Water Works, its technology, and its role in shaping the environmental history of the region. The Environmental Protection Agency funded the center's exhibit design; and the Pennsylvania Department of Environmental Protection, under Governor Ridge's Growing Greener program, is funding fabrication and installation of many of the exhibits.



Governor Whitman greets the audience after the ceremony.

The FWWIC is poised to benefit from capital improvements made recently in the immediate area. These improvements include the streetscape along Boat House Row, and improvements to the boat houses themselves; construction of Lloyd Hall; The Philadelphia Museum of Art landscape restoration; the Schuylkill River Park project; plus the magnificent \$26 million Fairmount Water Works restoration being undertaken by the Fairmount Park Commission. That restoration project includes the operation of a restaurant at the site, scheduled to open fall 2001. This investment is taking place because of the improved conditions of the water resources in the Delaware River Basin and the Estuary since the passage of the Clean Water Act in 1972 — a story which will also be told at the FWWIC.

As it was in the first half of the 19th Century, the Fairmount Water Works will once again become a major destination point for visitors from across the region, the nation, and around the world.

For more information about the FWWIC, please contact Ed Grusheski at (215) 685-6110, or Gail Tomlinson at (215) 685-4908.

Greenstart: The New Jersey Department of Environmental Protection's Voluntary Compliance Assistance Program

By Jay Springer, New Jersey Department of Environmental Protection Division of Watershed Management

The New Jersey Department of Environmental Protection (NJDEP) has developed a compliance assistance program known as Greenstart to proactively help small businesses and public employers comply with their environmental obligations. It is the only multi-media environmental compliance assistance program in New Jersey providing free on-site consultations by qualified NJDEP employees.

The program assists facility owners and operators in interpreting environmental regulations and evaluating compliance in the areas of air and water pollution control, solid and hazardous waste management, pesticide control, Right-to-Know (RTK), Toxic Catastrophe Prevention Act (TCPA), and spill containment plans under Discharge Prevention, Containment and Countermeasures (DPCC).

If a violation is detected, penalties are usually waived if the facility remedies the violation within six months, so long as it does not represent a serious offense such as criminal activity, a repeat offense, or one causing significant environmental or human harm or imminent endangerment.

At the closing of the on-site consultation, preliminary findings and compliance requirements are reviewed. Confidential and comprehensive reports of findings and recommendations are issued to the facility after the on-site visit. If necessary, free follow-up visits are conducted to ensure identified problems are corrected within an agreed upon time period.

For further information on the Greenstart Program, contact Mary C. Siller of NJDEP's Office of Local Environmental Management, Phone: (609) 633-0727, Fax: (609) 292-1803, Email: greenstart@dep.state.nj.us.

Stormwater Runoff: Lost Resource or Community Asset?

By Maya K. Van Rossum, Executive Director,
Delaware Riverkeeper Network

The Delaware River Keeper Network has released a new publication "Stormwater Runoff: Lost Resource or Community Asset?" This handbook was written by the Network as a "user friendly" guide to preventing, capturing, and recovering stormwater and reducing flooding and pollution.

Communities are growing and changing at an alarming rate throughout the Delaware River Watershed and the water resources of the region are suffering as a result. Sprawl development is causing stormwater runoff to increase and water quality to degrade.

Rain water that was once absorbed into vegetated soils, recharging aquifers and maintaining stream base flow and waterway health, is now collected on impervious parking lots, roads, and rooftops, temporarily caught in detention basins and then dumped into streams, wetlands, lakes, and rivers. Floodwaters rise, streambanks erode, critical aquatic and terrestrial habitats are lost, and water quality quickly declines. Without the necessary recharge, drinking water wells and the base flow of streams will dry up.

There is no excuse for this downward spiral of the watershed's health. Effective planning techniques that deter wanton development patterns, conservation design methods, Best Management Practices, and re-development and retrofitting of existing built-out areas can all be employed to protect and improve the watershed's natural resources, even as reasonable growth continues.

Riverkeeper's Stormwater Handbook strives to inform and encourage citizens, decision-makers, and professionals to progress beyond the limited and damaging stormwater management practices that have been the standard of the past three decades. Laid out in an extensively documented and readable way, the guide walks the reader through the problems and the solutions. Fact sheets that are meant for copying and distribution are included, packed with information about conservation design methods, Best Management Practices, and natural resource protection techniques.

Only when stormwater is recognized as a resource that is lost and an asset when saved, can communities begin to sustain development while protecting water quality and stream health.

The handbook is available from the Delaware Riverkeeper Network's office in Washington Crossing, Pennsylvania for a cost of \$15 plus \$4 shipping and handling. To request a copy, please call (215) 369-1188.



Schuylkill Watershed Congress

By Chari Towne,
Schuylkill Riverkeeper

Riverkeeper, in collaboration with the Alliance for Aquatic Resource Monitoring, organized the first Schuylkill Watershed Congress in March 1998. This effort brought together citizens from throughout the Watershed to share information as well as to acquire and polish monitoring skills. The response to that first Congress was so positive that Riverkeeper made a commitment to hold the event annually.

The Schuylkill Watershed Congress has grown a great deal since 1998 when sessions focused on monitoring and monitoring program support. Monitoring remains an important component, but the Congress now covers a wider range of topics, offers both introductory and advanced training opportunities, and field trips specifically designed to increase awareness of the changing nature of environmental threats throughout the watershed.

The 2001 Congress, held at Ursinus College, attracted over 180 participants, from all walks of life and all areas of the watershed. This year's event had a special focus on the Perkiomen watershed and water quality problems associated with sprawling development. Participants described the Congress as "excellent," "informative" and "even better than last year".

We're gratified to know that so many people find the Schuylkill Watershed Congress to be so rewarding, but we're not content to rest on past performance. Each year, with your help, we try to improve the Congress. We read evaluation forms carefully for suggestions and, as a result, we added the watershed caucus sessions for 2001. These small group discussions provided a snapshot of water quality concerns and the status of river protection efforts along the Schuylkill's tributary streams.

Mark your calendars now. We already have the date and location for next year's Congress: Saturday, March 2, 2002, at Temple Ambler, in Montgomery County. We are also looking for presenters. Presenters can be river advocates, watershed organizations, environmental consultants, schools, local governments, and state and federal agencies.

We hope you will join us in planning the 2002 Schuylkill Watershed Congress. For more information or to submit an abstract, please call Chari Towne at (610) 469-6005. Abstracts are due by September 30, 2001.

Species specific

The Delaware Bay Sandbar Shark Nursery Study

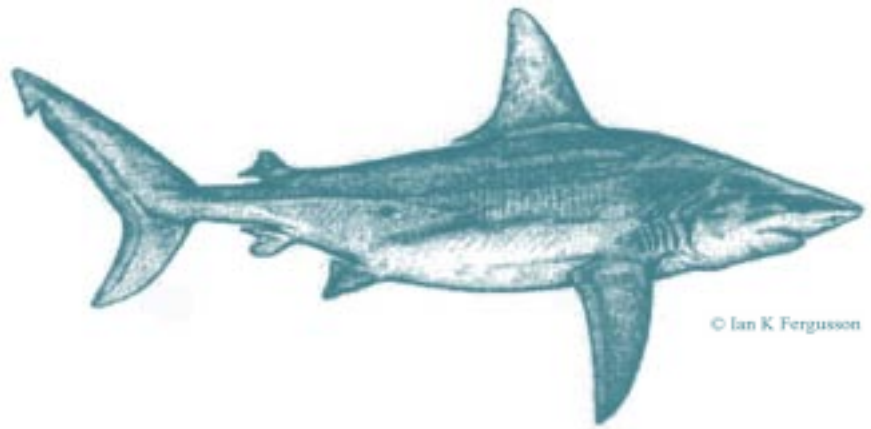
By Harold Wes Pratt, National Marine Fisheries Service, Narragansett Lab

The sandbar shark, *Carcharhinus plumbeus*, uses the coastal bays and estuaries along the western North Atlantic, including the Delaware Estuary, for nursery habitat. The sandbar shark is heavily exploited by the North Atlantic shark fishing industry, comprising as much as 80% of the U. S. commercial catch of large coastal sharks. However, little is known of their reproductive biology and nursery grounds. The existing information is limited and outdated. The lack of sufficient data necessitates the careful management of this resource, until such time as more data is gathered and analyzed. Such information is vital to understanding and managing sharks at this juvenile stage in their life, where they are most vulnerable to human influence.

To address these concerns, the staff of the National Oceanic and Atmospheric Administration-National Marine Fisheries Service's (NOAA-NMFS) Apex Predators Program has conducted an ongoing gill net and long-line fishing gear survey of the Delaware Bay. This survey was done with three goals in mind: 1) to tag neonate and juvenile sandbar sharks on their nursery grounds for delineating short- and long-term movements, 2) to characterize sandbar shark nursery habitats, and 3) to calculate a preliminary abundance for the sandbar shark in the Delaware Bay.

Indications do show that sandbar sharks are very slow growing, and have few young at a late age. Pregnant sharks briefly visit the inshore waters in early summer to give birth to approximately five to twelve pups. The young of the year (neonates) and juvenile sandbars seasonally reside in bodies of water such as the Delaware Bay for as long as 10 years. During that time, the juveniles are harmless, if undisturbed, and will stay until they grow to approximately four feet in length. (Sandbar sharks can eventually grow to 7 or 8 feet.) The juveniles will patrol shallow waters through late spring, summer, and early fall in search of the small fish and crustaceans on which they feed to maintain early growth and to prepare for their seasonal migrations south to warmer waters. The shallow turbid waters also offer some refuge from predators.

To conduct the study, a number of research sites, or stations, were set up throughout the Bay, in both New Jersey and Delaware. Gill nets were used to catch the sharks for tagging. Because gill nets often catch a large number and variety of species when used, efforts were made to minimize mortality and bycatch and to assure survival of the tagged species. The Sharks were tagged with a two-part blue nylon cattle ear tag, which was clipped through the shark's first dorsal fin.



Considering the preliminary data that has been collected, sandbar shark distribution in the Delaware Bay may be related to salinity and to distribution of forage species rather than surface water temperatures. Salinity preferences and prey distribution would help explain their patchy distribution. They are primarily distributed in shallow (3-4 meter) near shore waters over sand/mud benthic substrate, but sharks may be also found in deeper waters throughout the Bay. Dramatic shark catches in some areas show that juvenile sandbar sharks move together in the dozens or hundreds. Anecdotal evidence from acoustic telemetry suggests that juvenile sandbars move about with the tide. Long-term recaptures show that the juveniles spend the winter south of Cape Hatteras. Many sharks return to their natal nurseries. Others, as they grow, travel the East Coast, as far north as Martha's Vineyard. The adult distribution ranges from Cape Cod to Mexico.

The NMFS's lab in Narragansett, Rhode Island is the closest facility to the Delaware Bay that conducts shark life-history research. To conduct the study in the Delaware Bay, a staff was assembled and included students from the University of Rhode Island and Southampton College (Long Island, NY), and volunteers from the University of Delaware's Graduate College of Marine Studies in Lewes. Help from our colleagues at the National Aquarium in Baltimore, the State of Massachusetts Department of Natural Resources, the University of Maryland, and the Maryland Department of Natural Resources, were essential in conducting this ongoing study and was greatly appreciated.

For more information about the Sandbar Shark Study, please contact Harold Pratt at (401) 782-3200.

Estuary Basics

Pump-Out for Cleaner Water

By Karen Dorris, New Jersey Department of Environmental Protection
Division of Watershed Management, Lower Delaware Bureau

During the warm summer months, both residents and visitors come to the Delaware Estuary to enjoy the best that summer has to offer. Whether fishing in the Delaware Bay, or cruising on one of the many tributaries to the Delaware River, the Delaware Estuary is definitely a resource to be enjoyed. In recent years, the water quality of the River, Bay, and their tributaries has improved. As more people take to the waters of the Delaware for boating, fishing, and other recreational activities, the increase in activity brings with it the need for increased awareness to maintain water quality.

So what can boaters do to help ensure the protection of these resources? The proper disposal of boat sewage is one of the greatest contributions a boat owner or operator can make to help maintain water quality in the Estuary.

In 1992, Congress passed the Clean Vessel Act (CVA) to help reduce pollution from vessel sewage discharges. This marked the start of a five-year federal program which made funding available (\$40 million) from the Sport Fish Restoration Account of the Aquatic Resources Trust Fund. This funding was targeted to establish pump-out stations to pump waste out of recreational boat holding tanks. The Act was reauthorized in 1998, extending the program through 2003, and providing an additional \$50 million to continue promoting alternatives to overboard disposal of recreational boater sewage.

Why not just Dump It Overboard?

While some people may think that their seemingly small contribution is insignificant, their actions combined with the actions of countless others on the same river can have a significant impact on water quality. In addition, the discharging of untreated sewage on all fresh waters and any salt waters inside the three-mile territorial limits of the United States is illegal.

The discharge of untreated sewage can result in the contamination of shellfish areas and the spread of disease threatening both humans and wildlife, especially in portions of the Estuary where there is limited tidal flow or exchange of the water. Also, untreated waste contains organic material, which when broken down by bacteria in the water consumes large amounts of oxygen. This process decreases the overall amount of oxygen available in the water, causing stress to fish and other living resources in the Estuary.

Likewise, untreated waste contains fecal coliform, a bacteria found in the intestines of all warm-blooded animals. High levels of fecal coliform can result in the closing of shellfish areas to harvesting, as well as the potential closing of nearby bathing beaches.

What is a "Pump-Out" Station?

A pump-out station is a facility used to pump waste out of the holding tanks of recreational boats. While some smaller boats have portable toilets with removable tanks that can be dumped

PUMP-OUT FACILITIES IN THE DELAWARE ESTUARY



into a "dump station", most larger boats are equipped with one of three forms of Marine Sanitation Devices (MSDs) which hold waste for later disposal. All recreational vessels must have access to pump-out facilities constructed or maintained under the CVA, and a maximum fee of \$5.00 may be charged for use of pump-out facilities. There are currently sixteen pump-out facilities available for use in the Delaware Estuary. (See the above map for locations. The map is also available at the DRBC website: www.state.nj.us/drbc/). The Sport Fishing Promotion Council has also established a toll free number, 1-800-ASK-FISH, to assist boaters in locating the nearest pump-out and dump stations.

For more information about the Clean Vessel Act, please visit the official website at <http://fa.r9.fws.gov/cva/cva.html> or contact Gary Reinitz at Gary_Reinitz@fws.gov

All information for this article was gathered from the Clean Vessel Act website (<http://fa.r9.fws.gov/cva/cva.html>), various Clean Vessel Act publications, the New Jersey Marine Sciences Consortium, the DRBC website (www.state.nj.us/drbc/) and the NJ Division of Fish and Wildlife website (www.state.nj.us/dep/fgw/cvahome.htm).

Estuary Excursions

For many of us, the summer months are a time for exploration – a hike through a local park, a canoe trip down a tributary to the Delaware River, or possibly time spent in your garden. So, rather than focus on one particular excursion, we thought it would be nice to broaden your horizons, and to introduce our readers to some of the out-of-the-way places of interest in the Delaware Estuary. Please refer to the map on page 11 to locate the sites mentioned in the articles below. The sites are numbered (#) for easy reference.



Wilmington's Seventh Street Peninsula

The City of Wilmington's Seventh Street Peninsula (2), a bastion of history in a residential and industrial urban setting, is tucked away along the Christina River on Wilmington's East Side. In the 1600's the Peninsula was home to early Swedish settlers, who formed the first permanent settlement in the Delaware Valley. Today, **Fort Christina Park**

marks the location of their landing. The property adjacent to the park offers tours of an authentically recreated shipyard. The shipyard is also the northern berth of the **Kalmar Nyckel**, Delaware's Tall Ship Ambassador. (The Kalmar Nyckel can also be seen, further south in Lewes, Delaware.) Just a short walk from the shipyard, **Old Swedes Church** and historic farmhouse provide a glimpse into early colonial living in Delaware. The church is the oldest continually active protestant church in North America. For a quick bite, Seventh Street dead ends at "**Down the Hatch**," a casual spot for waterfront dining and local color.

For more information, *Kalmar Nyckel*, (302) 429-7447 or www.kalnyc.org; *Old Swedes Church* (302) 652-5629; *Down the Hatch* (302) 764-5549.

St. Jones River Watershed

The St. Jones River, located in central Delaware, meanders through farmland, Dover — Delaware's capital city, and preserved marshland on its way to the Delaware Bay. The **Dover Airforce Base Air Mobility Command Museum** (5) houses a growing collection of vintage aircraft and artifacts that reflect the evolution, history, and interests of the airforce base since 1941. The most exciting experience however, is standing next to those monstrous aircrafts. Just off of Kitts Hummock Road, immediately south of Dover Air Force Base, the **Delaware National Estuarine Research Reserve** (3) educates its visitors about the estuarine environment. It is an excellent location for hiking, birding, or taking a guided canoe trip along the St. Jones. On your way to the Reserve, you will pass the **John Dickinson Plantation** (4). Visitors can tour this historic property with guides dressed in period clothing. The property was once home to John Dickinson, a lesser known, but nonetheless influential person in framing the U.S. Constitution. Further down Kitts Hummock Road, the tiny coastal village of **Kitts Hummock**, beckons beachcombers. Hungry after all of that exploring? **Spense's Bazaar** in Dover, is an open-air market where you can fill yourself with Amish pastries and other goodies.

For more information, *Delaware National Estuarine Research Reserve* (302) 739-3436; *John Dickinson Plantation* (302) 739-3277; *Dover Airforce Base Air Mobility Command Museum* (302) 677-5938; *Spense's Bazaar* (302) 734-3441.

Upper Reaches of the Schuylkill River Watershed

The largest tributary to the Delaware Estuary, the Schuylkill River has defined this region culturally, economically, and historically. The **Port Clinton Transportation Museum** (6) (visits by appointment only) is devoted to the history of the Schuylkill Navigation System. This comprehensive system was comprised of canals, slack water, and dams, used to transport coal and other products to and from Schuylkill County and Philadelphia. The **Museum of Anthracite Mining** (7) in Ashland, while just north of the Estuary, will educate you about the mining of coal and the influence of coal on transportation and manufacturing. Not far away you can visit **Hawk Mountain Sanctuary** (8), which is the world's first refuge for raptors. It provides breathtaking views of the Schuylkill River Valley. The Sanctuary is a 2,400-acre natural area that has become an international center for raptor conservation, education, and research. Further down river, **Schuylkill Canal Park** (9), in Mont Clare, is home to the Schuylkill Canal, one of the last remaining sections of canal from the original navigation system. The Schuylkill Canal Association offers tours of a locktender's house that was built in 1836.

For more information, *Port Clinton Transportation Museum* (610) 562-9383; *Museum of Anthracite Mining* (570) 875-4708; *Hawk Mountain Sanctuary* (610) 756-6000; *Schuylkill Canal Association* (610) 917-0021.



The Mansion at John Dickinson's Plantation.

Salem and the Forts

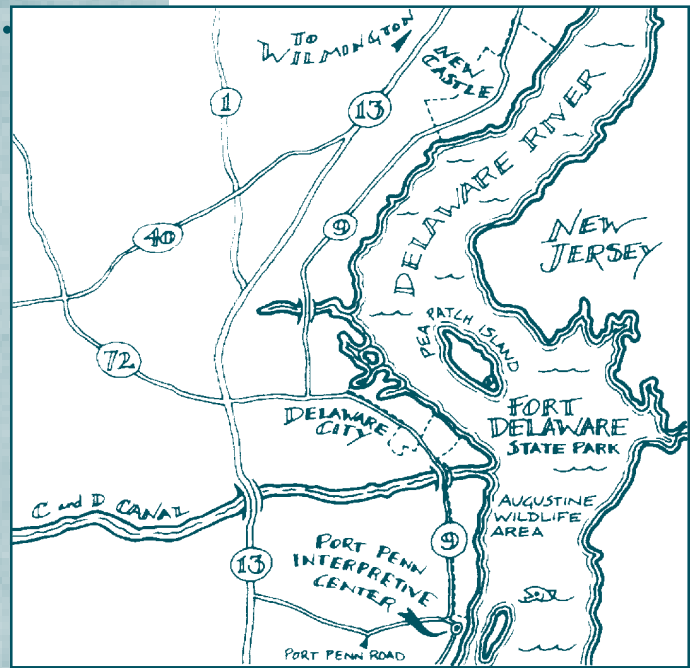
Salem (10), New Jersey, established in 1675, lies along the Salem River near its confluence with the Delaware. As the architecture of the town suggests, the area is rich in history, and tours are offered of many 19th and 20th Century residences. Nearby Fort Mott was built in the late 19th Century as part of a three-part defense system designed to protect Philadelphia from troops traveling upriver. Fort Mott as it stands today was begun in 1896. The Fort was named in honor of Major General Gersham Mott, a decorated Civil War veteran and native of New Jersey. From the 104-acre **Fort Mott State Park** (10), ferry service is available to Fort Delaware on **Pea Patch Island** (11), and from there to **Fort DuPont** (12) in Delaware City, Delaware. Fort Delaware was a Civil War prison camp where thousands of Confederate soldiers were held, many of who died in captivity and are buried in Finn's Point National Cemetery across the river in New Jersey.

For more information, Salem County Historical Society (856) 935-5004; Fort Mott State Park (609) 935-3218; Fort Delaware (302) 834-7941; Fort DuPont (302) 834-7941.

Cape May and the Maurice River Watershed

The extreme southern end of New Jersey has more than just the ocean beaches. Cape May and the Maurice River Watershed are areas with varied wildlife, fun festivals and events, and an interesting oystering heritage. The **Maurice River** (14), a National Wild and Scenic River, supports New Jersey's largest stand of wild rice and 53% of the non-marine animal species that New Jersey has recognized as endangered. In Bivalve, tours of oyster shucking houses are available. The **Delaware Bay Schooner Project** (13) will bring visitors on a 2-1/2 hour sail aboard the 1928 authentically-restored 115' schooner, the *A.J. Meerwald*. Also take a look at the last remaining land-based lighthouse in Cumberland County – the **East Point Lighthouse**. The Victorian town of **Cape May** (15) offers a number of tours: living history, guided walking, self-guided audio, or trolley tours. The **Wetlands Institute** (16) in nearby Stone Harbor, offers summertime nature walks, and other types of programming in the Delaware Estuary. **PSEG Estuary Enhancement Sites** are scattered throughout this region and brochures are now available for these sites. Consider visiting their Dennis Township and Maurice River Township sites, which are nearby. Want to see the other side of the Delaware Bay? All aboard the **Cape May – Lewes Ferry**, which will take you, as the name suggests, from Cape May to another charming town — Lewes, Delaware.

For more information, Maurice River Historical Society (856) 327-3714; Delaware Bay Schooner Project (856) 785-2060; East Point Lighthouse (856) 327-3714; Chamber of Commerce of Greater Cape May (609) 884-5508; The Wetlands Institute, (609) 368-1211; PSEG Estuary Enhancement Sites 1-888-MARSHES; Cape May – Lewes Ferry (800) 64-FERRY.



Let's Have Some Fun!

Marsh Creek State Park (17) – Downingtown, PA. Learn how to windsurf! (610) 458-5119

Brandywine Zoo (18) – Wilmington, DE. Come see the new snowy owl in Delaware's only zoo. (302) 571-7788

DeCou Orchards & Farm Market (19) – Shiloh, NJ. Have fun picking your own peaches and apples. 1-800-300-8851

Nice Spots for a Photo Op

Misphillion Lighthouse (20) – Slaughter Beach, DE. *Take Route 36 from Milford and make a left onto road 203 before entering Slaughter Beach. There is no phone number for this site. It's really off the beaten path.*

St. Peter's Village (21) – St. Peter's, PA. *Take Route 23 from Phoenixville and make a right onto St. Peter's Road immediately past Warwick Elementary School. The village is located along the banks of French Creek.*

Higbee Beach National Wildlife Management Area (22) – Cape May, NJ. Contains the last remnant of coastal dune forest on the bayshore. (609) 628-2103

Places to Learn a Thing or Two

Bowers Beach Maritime Museum (23) – Bowers Beach, DE. Houses a variety of maritime memorabilia. (302) 335-3462

Cedar Run Refuge (24) – Medford, NJ. A rehabilitation clinic for injured or orphaned wildlife. (856) 983-0326

Pennsbury Manor (25) – Morrisville, PA. William Penn's 17th Century country estate along the Delaware River. (215) 946-0400

estuary events

Upcoming Delaware Estuary Events and Happenings

Nature Photography

Saturday, July 14, 2001, 9:30 a.m.

Delaware Museum of Natural History
Greenville, Delaware

Brush up on your wildlife photography skills with Gus Teipelke of the Delaware Camera Club, who will meet participants at the Delaware Museum of Natural History. Bring a camera and film. To reserve a space, or for more information, please call (302) 239-5383.



Canoeing at Bayside

Saturday, July 14, 2001

The Nature Conservancy of New Jersey
Greenwich, New Jersey

Follow the tides as you navigate your way around an intricate network of tidal creeks at the Bayside Tract, a 4,500 acre preserve under PSEG's Estuary Enhancement Program. For more information, please call (609) 861-0600.

Seining Away!

July 21, August 11 & 25 and September 2, 2001

The Nature Conservancy of New Jersey
Cumberland and Cape May Counties

Learn to use seining nets in tidal waters along the bayshore to catch, identify, and release aquatic fish and invertebrate species. For more information, please call (609) 861-0600.

Oil Spill Lecture

Saturday, July 28, 2001, 1:00 p.m.

John Heinz National Wildlife Refuge
Philadelphia, Pennsylvania

Chris Pfifer of Entrix will lead a discussion about the Sunoco Oil spill restoration activities. For more information, please call (215) 365-3118.

Family Fun Event

Sunday, July 29, 2001, 11:00 a.m. – 2:00 p.m.

Killens Pond State Park
Felton, Delaware

A visitor appreciation day in celebration of Delaware State Parks 50th Anniversary. The family fun event at the waterpark will include live jazz music, crafts for kids, a raptor presentation and much more. For more information, please call (302) 284-4526.

River Rendezvous

August 3, 10, 17, 24, 31, and September 7 & 14, 2001,
12 noon – 2:00 p.m.

Maurice Riverfront at Buck and Main Streets
Millville, New Jersey

On Fridays throughout the summer, the Millville Recreation Department is sponsoring River Rendezvous, a series of lunchtime riverfront concerts. For more information, please call (856) 825-7000.

Manumuskin Hike

Saturday, August 4, 2001, 10:00 a.m.

The Nature Conservancy of New Jersey
Maurice River Township, New Jersey

Enjoy a hike through the Manumuskin River Preserve, the Conservancy's largest property in New Jersey, with an expert on the flora and fauna of the area. Explore a pine forest, freshwater tidal marshes, and the remains of historical structures from the 1800's. For more information, please call (609) 861-0600.

Wildflower Walk

Saturday, August 11, 2001, 1:00 p.m.

John Heinz National Wildlife Refuge
Philadelphia, Pennsylvania

Dick Cloud will lead a walk throughout the Refuge to identify various wildflowers. For more information, please call (215) 365-3118.

Garrison Weekend

Saturday, August 18, 2001

Fort Delaware
Delaware City, Delaware

Celebrate Delaware State Park's 50th Birthday with a large living history event. For more information, please call (302) 834-7941.



Our Wonderful Wetlands!

Thursday, August 23, 2001, 9:30 a.m. – 10:30 a.m.

Delaware National Estuarine Research Reserve
Dover, Delaware

Join a naturalist from the St. Jones Reserve for a walk along their 1/4 mile boardwalk trail and beyond. Wear comfortable shoes and bring sunscreen. For more information, please call (302) 739-3436.

19th Annual Wings 'n Water Festival

September 15 & 16, 2001

Wetlands Institute
Stone Harbor, New Jersey

A celebration of the coastal environment through the arts, this event will provide you with the opportunity to appreciate and/or purchase maritime art, bird and fish carvings, decoys, water related artwork and photography. For more information or to purchase tickets, please call (609) 368-1211.

Delaware Estuary



Key

- | | |
|---|--|
| 1. Fairmount Water Works | 13. Delaware Bay Schooner Project |
| 2. Wilmington's Seventh Street Peninsula | 14. Maurice River |
| 3. Delaware National Estuarine Research Reserve | 15. Cape May |
| 4. John Dickinson Plantation | 16. Wetlands Institute |
| 5. Dover Air Force Base | 17. March Creek State Park |
| 6. Port Clinton Transportation Museum | 18. Brandywine Zoo |
| 7. Museum of Anthracite Mining | 19. DeCoti Orchards |
| 8. Hawk Mountain Sanctuary | 20. Mispillion Lighthouse |
| 9. Schuylkill Canal Park | 21. St. Peter's Village |
| 10. Salem and Fort Mott | 22. Highte Beach National Wildlife Management Area |
| 11. Pea Patch Island/Fort Delaware | 23. Bowers Beach Maritime Museum |
| 12. Fort DuPont | 24. Cedar Run Refuge |
| | 25. Pennsbury Manor |

Please use this map to locate the places, towns, or waterways mentioned in articles in this edition of *Estuary News*. We hope this feature will help to enhance your knowledge of the Estuary region and to encourage you explore its fascinating resources.

DuPont RiverFest

Saturday, September 29, 2001, 10:00 a.m. – 5:00 p.m.
Tubman-Garrett Riverfront Park

Wilmington, Delaware

The DuPont RiverFest will celebrate the rejuvenation of Wilmington's waterfront and raise thousands of dollars for Delaware's youth by offering fun and exciting family entertainment. Admission and parking are free. For more information, please call (302) 658-1870.

National Estuaries Day

Saturday, September 29, 2001

Spread the word. Share *Estuary News* with a friend.

Coast Day - Delaware

Sunday, October 7, 2001

**University of Delaware, Graduate College of Marine Studies
Lewes, Delaware**

Discover the fascinating world of marine science through lectures, research demonstrations, ship tours, touch tanks, children's activities, a nautical crafts show, crab cake cook-off, seafood chowder contest, and much more. For more information, please call (302) 831-8083.

Coast Day NJ

Sunday, October 14, 2001

Cape May, New Jersey

Coast Day NJ is sponsored by the New Jersey Marine Sciences Consortium and its New Jersey Sea Grant College Program.

This free, day-long event is dedicated to promoting greater understanding and appreciation of New Jersey's marine and coastal environment. The event will be hosted at three Cape May locations: The Nature Center of Cape May, the Lobster House Restaurant and Dock, and Utsch's Marina. For more information, please call (732) 872-1300 x 22 or visit www.njmssc.org.

Wings Over Water

November 2, 3, and 4, 2001

Manteo, North Carolina

This three-day eco-festival will feature programming on owls, wolfs, and raptors, canoe and kayak trips, and pelagic bird tours all on the Outer Banks of North Carolina. Registration is \$25 per person and includes complimentary admission to a number of area attractions. To order a registration packet, please call (252) 441-8144.

Save the Date

**Experience the Estuary
Tuesday, September 25, 2001
Lloyd Hall, Fairmount Park
Philadelphia, Pennsylvania**

Experience the Estuary is the Partnership for the Delaware Estuary's third annual celebration. This evening event will feature a reception/silent auction, dinner, and the Second Annual Excellence in the Estuary Awards. For ticket information, please call 1-800-445-4935.

NEWS IN A FLASH

to be
periodically
updated about
volunteer
activities,
events, and
programs
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What is the Delaware Estuary Program?

The Delaware Estuary Program (DELEP) is a partnership of governmental agencies, nonprofits, the private sector, and citizens working together to restore and protect the Delaware Estuary. It was established in 1988 and is one of 28 national estuary programs around the nation. The estuary region extends from Trenton, New Jersey to the mouth of the Delaware Bay. To learn more about DELEP activities, visit www.delep.org.

WHO IS THE PARTNERSHIP?

The Partnership for the Delaware Estuary, Inc. is a private, nonprofit organization established in 1996. The Partnership promotes the estuary as a regional resource through public outreach and education. It also serves as the education, outreach, and fundraising arm for the Delaware Estuary Program. 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.

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