

Delaware River Basin Commission

Annual Report

2013



The Delaware River Basin Commission (DRBC) is a federal-interstate agency created in 1961 by compact legislation signed into law by President John F. Kennedy and the governors of the four basin states with land draining to the Delaware River. The passage of this compact marked the first time that the federal government and a group of states joined together as equal partners on a regional body with the force of law to oversee a unified approach to managing a river system without regard to political boundaries.

The Delaware is the longest un-dammed river in the United States east of the Mississippi, extending 330 miles from the confluence of its East and West branches at Hancock, N.Y. to the mouth of the Delaware Bay where it meets the Atlantic Ocean. In all, the Delaware River Basin (DRB) contains 13,539 square miles, draining parts of Pennsylvania, New Jersey, New York, and Delaware. Over 15 million people (approximately five percent of the nation's population) rely on the waters of the DRB for multiple uses, but the watershed drains only four-tenths of one percent of the total continental U.S. land area. The population served by DRB water includes about 8.3 million basin residents as well as over seven million people in the New York City area and northern New Jersey who live outside the basin. New York City gets roughly half its water from three large reservoirs located on tributaries to the Delaware.

This publication, which covers calendar year 2013, was compiled and edited by DRBC Communications Manager Clarke Rupert and created by DRBC Graphic Designer Susan Owens. Numerous commission staff provided valuable assistance. It is available on the commission's web site at www.drbc.net. Copies are available upon request by contacting the DRBC (P.O. Box 7360, West Trenton, NJ 08628; 609-883-9500).

Cover: The featured image is a composite of three separate photos, including an aerial view of the Delaware River at Narrowsburg, N.Y. and bald eagles that can be frequently seen there soaring overhead. The composite photo is courtesy of David B. Soete.



Delaware River Basin Commission

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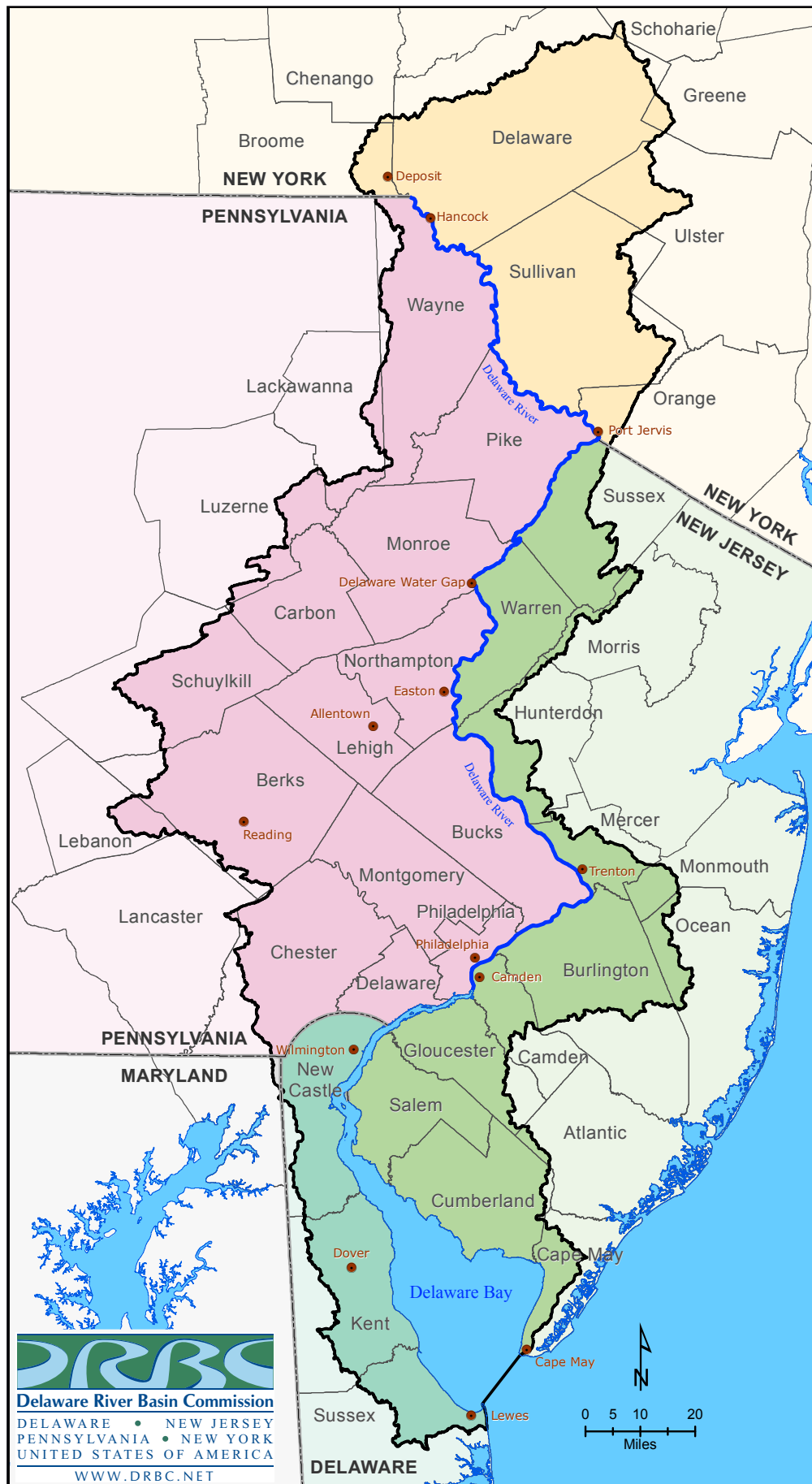
WWW.DRBC.NET



A ceremonial signing of the Delaware River Basin Compact, which created the DRBC, took place at the White House on Nov. 2, 1961. Seated in the Oval Office (from left to right) are Gov. Robert Meyner of New Jersey, Gov. Elbert Carvel of Delaware, Gov. David Lawrence of Pennsylvania, and President Kennedy. In his remarks, the President said, “We are glad to join with Delaware, New Jersey, New York, and Pennsylvania in this bold venture. The task set for the Commission will not be easy to achieve, but we are confident that the cooperation that has brought forth this Compact will endure, and that working together real progress can be made for the people of the Basin.”

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Executive Director's Message

By Carol R. Collier

Spring 2014

It's difficult to be writing my last message as Executive Director of the DRBC. These 15 years went very fast, and I believe that we accomplished a lot. It has been a pleasure and an honor to work with an outstanding team of people on the protection and management of the mighty, majestic Delaware River and its 13,500 square mile basin. Successful management of a river is definitely founded on good teamwork!

As I look back, the major issues and accomplishments included working with the dischargers, environmental groups, and co-regulators to develop a realistic PCB clean-up strategy for the tidal Delaware River and Bay and setting a water quality criterion that, when reached, will eliminate the need to issue fish consumption advisories due to PCBs. I am also very proud of the designation of the entire non-tidal river as Special Protection Waters. This provides a higher bar of protection for these high quality waters, requiring no measurable change to existing conditions – keeping the clean water clean. We also worked our way through a couple of droughts and the three floods of 2004-2006. During the droughts, already agreed upon management plans were put in place and no industry was required to cut back production. The river basin had not seen severe flooding in almost fifty years and the three floods changed our priorities. A number of the excellent recommendations from the Interstate Flood Mitigation Task Force have been acted upon, including improved flood warning systems and changes in reservoir operations. Other accomplishments include the development of the Water Resources Plan for the Delaware River Basin along with subsequent State of the Basin reports and annual implementation updates to track the ongoing progress towards achieving shared goals. Building upon its previous water conservation program accomplishments, the DRBC in 2009 implemented a new water audit approach to identify and control water loss—I believe the significance of this action will grow over time. Also, the Dr. Ruth Patrick River Garden at DRBC's offices is now complete and can be enjoyed by the basin community.

As I look forward, I see that the river basin commission is needed now more than ever. There are many complex and intertwined issues affecting the basin that cannot be solved from any one sector or one state. These include the water footprint of increasing energy generation, changing population dynamics and land cover, and the need for an ecological flows policy. Overlaid on top of all of these is the threatening sea level rise and changes in our regional temperature and precipitation patterns. These drivers can have a significant impact on how water is managed in the basin. The other unanswered concern is funding. The management of a river basin is most

environmentally effective and cost-effective if done holistically by bringing decision makers together to address the issues. I hope that the federal and state governments will find a way to support the commission. I know that the knowledgeable and dedicated staff of DRBC can tackle the technical issues and provide sound recommendations to the commissioners. I wish all the best to the commissioners, DRBC staff, and new Executive Director Steve Tambini.

Carol R. Collier



Dr. Ruth Patrick with Carol Collier at the 2005 ceremony naming the DRBC's courtyard in honor of the pioneering ecologist. Additional information about Dr. Patrick, who passed away in 2013, can be found on page 17. (Photo by DRBC)

Signatory Members

NEW JERSEY



Governor Chris Christie

The ex officio members of the Delaware River Basin Commission include the four basin state governors and the Division Engineer (commonly referred to as the Commander) of the U.S. Army Corps of Engineers North Atlantic Division (NAD) who serves as the federal representative.

NEW YORK



Governor Andrew M. Cuomo

The five members appoint alternate commissioners, with the governors typically selecting high-ranking officials from their state environmental agencies. Each commissioner has one vote of equal power with a majority vote needed to decide most issues. Exceptions are votes on drought declarations and the apportioned amounts among the signatory parties to support the current expense budget, which require unanimity.

DELAWARE



Governor Jack A. Markell

New Jersey

The following state environmental officials continued to represent **Governor Chris Christie** on the DRBC during 2013: Department of Environmental Protection (DEP) Commissioner **Bob Martin** (alternate), Deputy Commissioner **Michele Siekerka** (second alternate), Division of Water Supply and Geoscience Director **Fred Sickels** (third alternate), and State Geologist **Karl W. Muessig** (fourth alternate).

of Water Assistant Director **Tom Cullen** (third alternate), and Bureau of Water Resource Management Director **Angus Eaton** (fourth alternate) continued to represent **Governor Andrew M. Cuomo** on the commission.

New York City DEP Commissioner **Carter H. Strickland, Jr.** remained the advisor to the New York State DRBC commissioner during 2013.

Delaware

The appointees named by **Governor Jack A. Markell** to represent him on the DRBC in 2013 remained Department of Natural Resources and Environmental Control Secretary **Collin P. O'Mara** (alternate) and Division of Water Director **Kathleen M. Stiller** (second alternate).

PENNSYLVANIA



Governor Tom Corbett

Pennsylvania

As 2013 began, the appointed representatives of **Governor Tom Corbett** on the commission continued to be DEP Secretary **Michael L. Krancer** (alternate), Deputy Secretary for Water Management **Kelly Jean Heffner** (second alternate), Director of Interstate Waters **Andrew Zemba** (third alternate), **Charles Kirkwood** (fourth alternate), and Executive Assistant **Randal (Duke) Adams** (fifth alternate). Michael Krancer returned to the private sector in April and was succeeded by Secretary **E. Christopher Abruzzo**, who was named by Gov. Corbett as his new alternate.

UNITED STATES



Brigadier General
Kent D. Savre

New York

Department of Environmental Conservation Commissioner **Joseph Martens** (alternate), Division of Water Director **Mark Klotz** (second alternate), Division

Federal Government

Lieutenant Colonel John Christian Becking (Philadelphia District Engineer), **David J. Leach** (NAD Director of Programs), and **Erik Rourke** (Chief, Project Development) were appointed by **Brigadier General Kent D. Savre** to serve as his alternate, second alternate, and third alternate, respectively, during 2013.

Commission Officers

The Delaware River Basin Compact requires the annual election of a chair and vice chairs, which historically has been based upon rotation of the compact's five signatory parties. The following members served as commission officers during calendar year 2013:

*January 1, 2013 through June 30, 2013
(one-year term began July 1, 2012)*

Chair: Governor Corbett (Pennsylvania)
Vice Chair: Governor Christie (New Jersey)
Second Vice Chair: Governor Cuomo (New York)

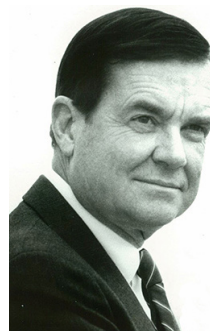
*July 1, 2013 through December 31, 2013
(one-year term to end June 30, 2014)*

Chair: Governor Christie (New Jersey)
Vice Chair: Governor Cuomo (New York)
Second Vice Chair: Governor Markell (Delaware)

The current list of commission members and their alternates can be viewed at www.nj.gov/drbc/about/commissioners/.

In Memory of Three Former DRBC Members

William P. Clark (1931-2013)



William Clark, the 44th Secretary of the Interior who served as federal member to the DRBC during the Reagan Administration, died August 10 at

his home in California. He was 81 years old.

Secretary Clark was appointed by President Reagan as the federal member to the DRBC on February 24, 1984 and chaired the commission until June 30, 1984. He served as the U.S. member until his resignation as Interior Secretary on February 7, 1985.

The DRBC's 1984 annual report notes that much of the commission's attention during the year when Secretary Clark served as the federal member was focused on drought preparedness and associated issues of conservation, salinity intrusion, and groundwater management. As described in the 1984 report's introduction, "Indeed, in its more than 23 years of service, the Delaware River Basin Commission has engaged in the full range of water management activities—some,



(from left to right) Commissioner Kathleen Stiller (Del.), Commissioner Angus Eaton (N.Y.), Executive Director Carol Collier, Commissioner Kelly Heffner (Pa., chair), Commissioner Michele Siekerka (N.J.), and Commissioner Chris Becking (U.S.) at the Washington Crossing Historic Park Visitor Center in May 2013. Behind the commissioners is a replica of Emanuel Leutze's "Washington Crossing the Delaware" painting. The original artwork is at the Metropolitan Museum of Art in New York City. (Photo by Clarke Rupert/DRBC)

at times, more heavily than others. But since 1980, uncontrollable changes in weather patterns have imposed a seeming preoccupation with drought, and more drought.”

Prior to his appointment as Interior Secretary, William Clark held the position of national security adviser to President Reagan and was described by Time magazine in a 1983 cover story as “the second most powerful man in the White House.”

William W. Scranton (1917-2013)

William Scranton, Pennsylvania’s 38th governor, died July 28 in California. He was 96 years old.

Gov. Scranton served as a DRBC member during his one-term from 1963 to 1967. These years were the agency’s formative period, when the commission adopted its first Water Resources Program (a six-year action timetable based on the long-range content of the Comprehensive Plan)

as well as its Rules of Practice and Procedure.

Gov. Scranton and the other four members of the newly created DRBC were tested with the challenges of addressing not only the basin’s six-year “drought of record” (1961 to 1967), but also the great public outcry for cleanup of polluted waters. As described in the DRBC’s 1966 annual report:

“Since the commission’s compact jurisdiction encompasses virtually all phases of water management, the agency was thrown immediately into the midst of these critical situations. Under arrangements forged by the commission, the drought perils that confronted Delaware-reliant areas have been warded off thus far. The major tests of the commission’s pollution abatement effectiveness still lie ahead, although the start has been made.”



Alternate N.J. Commissioner Richard Sullivan (*far right*) is pictured here sitting next to Gov. William Cahill and Philadelphia Water Commissioner Samuel Baxter (*far left*). This photo was taken at the 1971 DRBC meeting in Dover, Del.

Richard J. Sullivan (1927-2013)

Richard Sullivan, the first commissioner of the New Jersey Department of Environmental Protection, died December 10 at his home in New Jersey. He was 86 years old.

While NJ DEP commissioner, Mr. Sullivan also served as Governor William T. Cahill’s alternate on the DRBC from 1970 to 1974.

NJ DEP was created on our nation’s first Earth Day, April 22, 1970. Under Commissioner Sullivan’s leadership, New Jersey became only the third state at that time to consolidate all of its environmental programs under one agency.

He later helped to create the New Jersey Pinelands Commission in the late 1970s to protect the million-acre pine, oak, and cedar forests in South Jersey, and served for 10 years as its chairman.



Gov. Scranton (*second from the right*) participated in the Feb. 27, 1963 DRBC meeting held in Wilmington, Del., which was the first commission session attended by all four basin state governors and Secretary of the Interior Stewart Udall (DRBC federal member). Attendees included (*from left to right*) Gov. Elbert Carvel (Del.), Gov. Richard Hughes (N.J.), Secretary Udall, Gov. Nelson Rockefeller (N.Y.), Gov. Scranton, and Lt. General W.K. Wilson, Jr. (Chief of Army Engineers).

Commission Staff

The current list of DRBC staff members, including their phone number extensions and e-mail addresses, can be viewed at www.nj.gov/drbc/about/staff/.

New Employee

- **Jessica Sanko** – Secretary, Modeling, Monitoring, and Assessment Branch (MMA)/ Planning and Information Technology Branch (PIT).

Retirement

- **Kenneth Stoller** – Project Review Section Supervisor, Water Resources Management Branch (WRM).

Promotion

- **David Kovach** – Project Review Section Supervisor, WRM, upon the retirement of Ken Stoller. David previously served as Geologist/Hydrologist in the Project Review Section.

Resignations

- **Jeffrey Iudicello, Ph.D.** – Water Resources Engineer/Modeler, MMA.
- **Valerie Zigon-Richardson** – Operations Section Secretary, WRM.
- **Donna Barnett** – Secretary, PIT.



(from left to right) Alan Roberson (AWWA), Tony Willardson, U.S. Rep. Grace Napolitano (CA-32), Bob Tudor, and Eric Evenson at the National Water Census congressional briefing on Capitol Hill. (Photo by Ali Coyle/USGS)

Staff News

- Deputy Executive Director **Bob Tudor** on Sept. 13 participated in a congressional briefing in Washington, D.C. to share information on how the U.S. Geological Survey (USGS) and its partners are making progress towards a National Water Census. Other speakers at the “Every Drop Counts” briefing included USGS National Water Census Coordinator Eric Evenson and Western States Water Council Executive Director Anthony Willardson. The event was hosted by the American Water Works Association (AWWA). Tudor’s presentation to the approximately 40 attendees provided DRBC’s perspective on Water Census progress. The Delaware River Basin, Apalachicola-Chattahoochee-Flint Basin, and Colorado River Basin are the three focus areas under review as part of this USGS water availability initiative. “The more accurately we can assess the quantity and quality of our water resources, the better we can know whether our strategies for conserving and improving those resources are actually having the desired beneficial effect,” Tudor said.
- Executive Director **Carol R. Collier** served as the national president of the American Water Resources Association (AWRA) during 2013. The position provided her the opportunity to be an advocate for Integrated Water Resources Management not

only in the Delaware River Basin, but throughout the United States. Founded in 1964, AWRA is a professional association dedicated to the advancement of water resources management, research, and education.

- **Namsoo Suk, Ph.D.** and **Thomas Fikslin, Ph.D.** from the Modeling, Monitoring, and Assessment Branch met with three members of the Korean Ministry of Environment on Oct. 18. The delegation’s interest in visiting DRBC was to learn more about the commission and its Total Maximum Daily Load (TMDL) development efforts. In order to effectively communicate with the delegation, Dr. Suk ran the meeting mostly in Korean, translating into English when necessary. A TMDL is the maximum amount of a specific pollutant that can be assimilated by a stream without causing impairment or violating water quality standards. DRBC, at the request of the three estuary states and the U.S. EPA, took the lead in developing the technical basis for PCB TMDLs for the Delaware Estuary.
- The Partnership for the Delaware Estuary held its 5th Science and Environmental Summit on Jan. 27-30 in Cape May, N.J. Themed *Weathering Change - Shifting Environments, Shifting Policies, Shifting Needs*, this biennial conference sought to create more effective partnerships and share information among scientists,

outreach specialists, resource managers, and others with an interest in the prosperity of the Delaware Estuary. Several DRBC staff members participated in the summit as panel moderators or presenters, including **Carol R. Collier, Jessica Sanchez, Ph.D., John Yagecic, David Sayers, Thomas Fikslin, Ph.D., Greg Cavallo, Namsoo Suk, Ph.D., and Ron MacGillivray, Ph.D.** DRBC Commissioner **Kelly Heffner** (Pa.) also participated on a panel.

- Several DRBC staff participated in the 98th Annual New Jersey Water Environment Association Conference on May 13-17 in Atlantic City, N.J. **William Muszynski** and **Amy Shallcross** moderated a session entitled *Watershed Management 2013* while **Thomas Fikslin, Ph.D.** and **Greg Cavallo** joined with several others to present on PCB remediation efforts.
- The Mid-Atlantic Conference of the American Water Resources Association was held in September in West Windsor, N.J. **Carol R.**

Collier welcomed participants to the two-day conference which was themed *Water Resources: Adaptation and Advancement*. Presentations were given by DRBC staff members **John Yagecic** and **Kent Barr**.

- The *Accelerating Action: The Delaware River Watershed Forum* was held in October at The Academy of Natural Sciences of Drexel University in Philadelphia, Pa. Hosted by the Coalition for the Delaware River Watershed with funding support from the William Penn Foundation, this free, two-day forum brought together over 200 people from more than 60 non-government organizations, as well as those representing public agencies and universities, to explore key issues affecting conservation and restoration work in the watershed. The first day focused on landscapes, and the second day focused on watershed-wide issues; each included a series of facilitated, action-focused discussions. DRBC staff members participating in the forum

included **Carol R. Collier, Jessica Sanchez, Ph.D., and Erik Silldorff, Ph.D.**

In Remembrance

- The DRBC was saddened by the passing of **W. Brinton (Buzz) Whitall**, who died in May at the age of 86. Mr. Whitall served as the first commission secretary and retired from the DRBC in 1982. His work spanned more than a quarter-century, beginning in 1955 as a planner with the pre-DRBC Delaware River Basin Advisory Committee. He attended the ceremonial signing of the Delaware River Basin Compact in 1961 at the White House.

Two DRBC Executives Announce 2014 Retirement Plans

Carol R. Collier and Bob Tudor both announced their upcoming retirements that would become effective in 2014. Ms. Collier informed the public at the Sept. 2013 commission meeting that she would be retiring after 15 years of service on March 12, 2014. Carol was sworn in as the DRBC's third executive director on Aug. 31, 1998, becoming the first woman to head an interstate-federal compact agency. Mr. Tudor notified the commissioners in November of his plans to retire on June 1, 2014. Prior to joining the DRBC staff on Oct. 1, 2001 as its second deputy executive director, Bob served more than 20 years with the New Jersey Department of Environmental Protection. He was an alternate commissioner on the DRBC representing N.J. Gov. Christine Todd Whitman from 1998-2001.



DRBC periodically receives requests to host delegations from other countries to discuss the commission and its programs. A delegation of 20 environmental regulatory officials who work at the national, provincial, and local levels in the People's Republic of China visited DRBC on Feb. 28, 2013. (Photo by Katharine Schmidt/DRBC)

Annual Hydrologic Conditions Summary

The Delaware River Basin (DRB) was able to get through 2013 without droughts, main stem flooding, hurricanes or tropical storms. Nevertheless, Mother Nature still deserved a watchful eye. For example, we witnessed record-breaking rainfall in some portions of the basin during June and July. Here's a brief hydrological recap:

Precipitation

Twenty-three of the 38 reported counties within the DRB experienced above-normal precipitation from January through December 2013. Annual precipitation departures from normal ranged from 7.5 inches *above* normal in Sussex County, Del. to 10.2 inches *below* normal in Luzerne County, Pa.

June was a particularly wet month throughout the basin as evidenced by two broken records—Philadelphia's 10.56 inches surpassed the previous wettest June rainfall record of 10.06 inches set in 1938 and Wilmington's 13.66 inches shattered the previous record of 9.90 inches set in 2003. Another monthly record in Philadelphia was set in July when 13.24 inches of rain fell, surpassing the previous high mark of 10.42 inches in 1994. To put these monthly records in perspective, Philadelphia and Wilmington normally receive 41 to 43 inches of precipitation over an entire year!

Streamflow

Monthly mean streamflow observations at 18 select stations in the basin began the year in the

normal or above-normal range. However, flows fell to normal or below-normal levels during the spring months in response to below-normal precipitation. Along the main stem Delaware River at Montague, N.J. and Trenton, N.J., flows during April averaged only 47% and 56% of normal, respectively.

With the above-normal precipitation that fell in June and continued through August, streamflow observations responded to normal or above-normal ranges throughout the summer months. Flows on the Delaware River at Montague and Trenton in June averaged 353% and 290% of normal, respectively.

The basin experienced below-normal precipitation during the fall of 2013, with normal to below-normal streamflows observed at the select stations over much of this period. Delaware River flows at Montague and Trenton in November averaged only 57% and 43% of normal, respectively.

With the return of above-normal precipitation in December, streamflow observations at the select stations were in the normal or above-normal range as the year closed.

Groundwater

The average monthly groundwater levels in 10 reported USGS monitoring wells in the Pennsylvania portion of the basin began the first quarter of 2013 within the normal range. However, below-average precipitation during this period

More detailed information about the basin's hydrologic conditions can be found on the DRBC web site at www.nj.gov/drbc/hydrological.

eventually resulted in groundwater levels at seven of the 10 observation wells falling to below-normal ranges in April. Groundwater conditions at the monitoring wells remained basically the same or experienced a slight improvement over the next two months. The above-normal precipitation that fell in June and continued through the summer months recharged groundwater levels to normal and above-normal ranges. As a result of the drier than normal autumn, groundwater levels at these 10 observation wells gradually dropped to normal and below-normal ranges by mid-December.

The groundwater level in the New Castle County, Del. coastal plain well began the year within the normal range, but declined to below-normal by mid-April in response to below-average precipitation during the late-winter and spring months. Improvement to the normal range occurred by mid-June in response to the above-normal precipitation, where it remained through the end of the year.

The groundwater level in the Cumberland County, N.J. coastal plain observation well also began 2013 within the normal range and remained there until early-July when rainfall increased the water

level to above the normal range. Groundwater conditions would remain in the above-normal range at this monitoring well until early December, when it returned to the normal range.

Upper Basin Reservoir Storage

The three New York City (NYC) Delaware Basin reservoirs—Cannonsville, Pepacton, and Neversink—are located in the upper DRB on headwater tributaries feeding the main stem Delaware River. Since the combined storage in these three reservoirs did not fall below the drought watch level

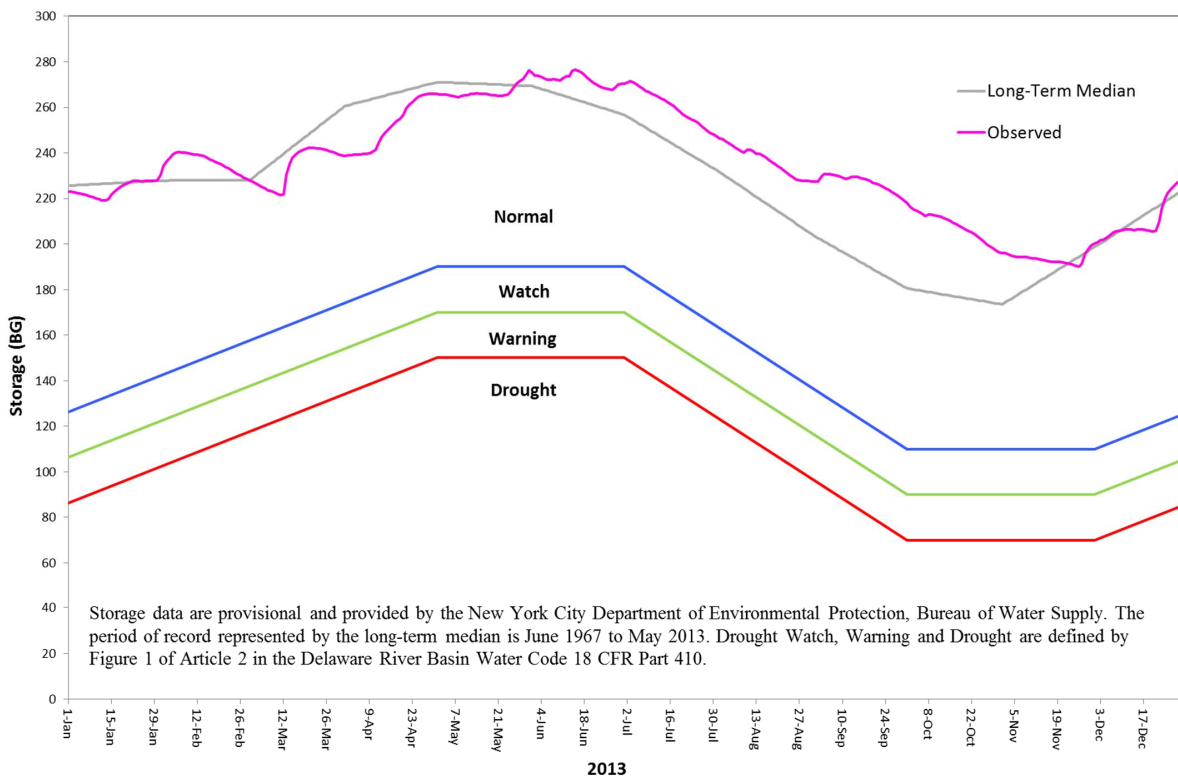
during 2013, the implementation of DRBC’s basinwide drought operating plan was not required.

On January 1, 2013, the combined storage in the three NYC Delaware Basin reservoirs was about 223 billion gallons (bg), which is slightly below the long-term median for that date. Combined storage rebounded to above the long-term median from late-January through late-February, but then declined to below median levels over the next three months. The NYC reservoirs refilled to capacity by late May and remained above the long-term median through mid-November. Combined storage

remained near the long-term median levels for the remainder of the year. On December 31, combined storage was 232 bg, which is about 86% usable capacity and 7 bg above the long-term median storage for the last day of the year.

The Office of the Delaware River Master directed releases from the NYC Delaware Basin reservoirs totaling 24.7 bg over a six-month period in 2013 to meet the normal flow objective of 1,750 cubic feet per second (cfs) in the Delaware River at Montague as required by the 1954 U.S. Supreme Court Decree. Nearly 22 bg of this annual total occurred

**New York City-Delaware River Basin Storage
2013**



This graph shows the observed combined water storage in the NYC-Delaware Basin reservoirs (Cannonsville, Pepacton, and Neversink) during 2013, as well as the long-term median and drought rating curves.

during October and November. For comparison purposes, directed releases to meet the Montague minimum flow target totaled 22.3 bg in 2012 and 101 bg during the drought year 2001.

Lower Basin Reservoir Storage

Both Beltville Reservoir (located on the Pohopoco Creek, a tributary of the Lehigh River) and Blue Marsh Reservoir (located on the Tulpehocken Creek, a tributary of the Schuylkill River) maintained

storage in the normal range during 2013. Consequently, the DRBC's lower basin drought operating plan was not implemented.

The commission directed releases totaling 614 million gallons from Beltville Reservoir between the end of September and mid-November to maintain the Delaware River flow objective of 3,000 cfs at Trenton.

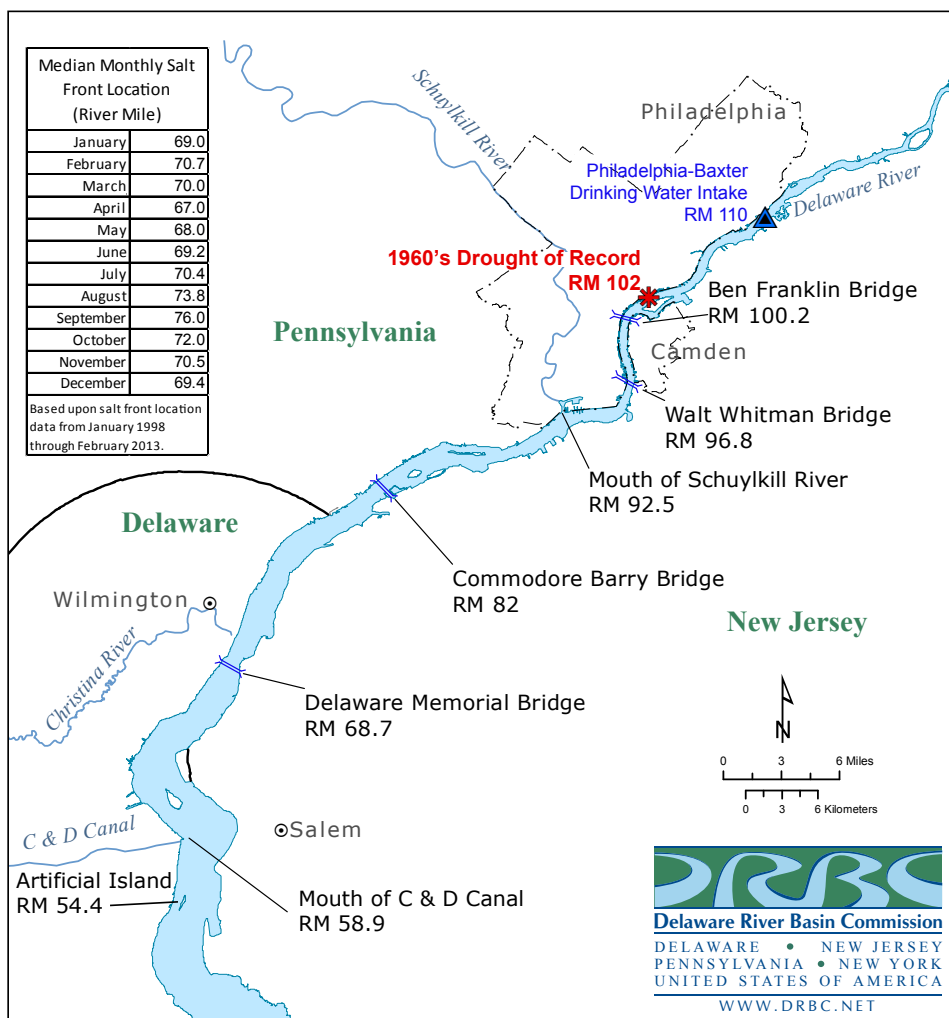
No releases were made from Merrill Creek Reservoir during 2013. Storage in this reservoir, located near Phillipsburg N.J., is used to replace

evaporative losses (consumptive use) caused by power generation when the basin is under DRBC-declared drought operations and the equivalent average daily flow target for the Delaware River at Trenton is below 3,000 cfs.

Salt Front

The salt front or salt line is defined as the 250 parts-per-million (or milligram-per-liter) chloride concentration. The seven-day average location of the salt front is used by DRBC as an indicator of salinity intrusion in the Delaware Estuary. The salt front's location fluctuates along the Delaware River as streamflow increases or decreases in response to changing inflows, diluting or concentrating chlorides in the river.

The farthest upstream location of the salt front in 2013 was river mile (RM) 82 during the third week of November. This location is in the vicinity of the Commodore Barry Bridge four miles upstream of the Delaware-Pennsylvania state line. In comparison, the salt front reached RM 102 (two miles upstream of the Benjamin Franklin Bridge) during the 1960's drought of record.



This map indicates the farthest recorded upstream location of the salt front (RM 102) in relation to several other sites along the Delaware River. RM 0 is located at the mouth of the Delaware Bay (i.e., where the bay meets the Atlantic Ocean). The table inset lists the median monthly salt front locations by river mile.

Water Quality Program Highlights

DRBC Updates PCB and pH Water Quality Criteria for Delaware River and Bay

The DRBC in December adopted updated water quality criteria for polychlorinated biphenyls (PCBs) in the Delaware Estuary and Bay and also for pH in interstate tidal and non-tidal reaches of the main stem Delaware River.

The updated PCB criteria for the protection of human health from carcinogenic effects is 16 picograms/liter. This number, based upon the most current methodology and scientific data available, is now a uniform value for the entire Delaware Estuary and Bay (DRBC Water Quality Zones 2-6). The criteria previously varied according to the water quality zone, differed from that of the basin states, and did not take into account site-specific data and current U.S. Environmental Protection Agency (EPA) guidance on the development of human health criteria.

This update was originally proposed in 2009, but action was deferred pending further refinement of an implementation strategy to support achievement of the revised PCB water quality criteria. While comment on an updated implementation strategy was solicited simultaneously with the current PCB criteria revision, there was no planned commission action on the strategy.

The Delaware Estuary and Bay are considered impaired for PCBs, and the U.S. EPA has established total maximum daily loads (Stage 1 TMDLs) for these water bodies.

A TMDL expresses the maximum amount of a pollutant that a waterway can receive and still attain water quality standards. With DRBC's adoption of revised PCB criteria, it is anticipated that EPA will establish new TMDLs (Stage 2 TMDLs) corresponding to the updated criteria. In the associated report accompanying the Stage 2 TMDLs, EPA will include the proposed implementation strategy as an appendix and will solicit comment on the report and strategy in 2014.

PCBs have been classified by EPA as a probable human carcinogen. The U.S. banned the manufacture and general use of PCBs in the late 1970s, but not before 1.5 billion pounds of the substance was produced.

The updated PCB criteria was developed under the guidance of the commission's Toxics Advisory Committee, comprised of representatives of the four basin states as well as members of the academic, agricultural, public health, industrial and municipal sectors, and non-governmental environmental community. A public hearing on September 10 preceded the December rulemaking action.

The commissioners at their December 4 public business meeting also adopted revised pH water quality criteria for the main stem Delaware River and tidal tributaries up to the head of tide. DRBC's pH criteria have not been updated since being established in 1967. The old pH criteria were expressed as ranges and were different for the tidal

(between 6.5 and 8.5) and non-tidal (between 6 and 8.5) river. The approved criteria range (between 6.5 and 8.5) is now uniform for the entire main stem Delaware, minimizes regulatory inconsistencies between DRBC criteria and that of the basin states and EPA, and better addresses natural pH cycles in the main stem Delaware River.

The revisions to the pH criteria were unanimously endorsed by the DRBC's Water Quality Advisory Committee, comprised of regulators, municipal and industrial dischargers, academicians, and environmental organizations, which advises the commissioners on technical matters relating to water quality within the basin. The proposed rulemaking was the focus of a public hearing on October 24.

Delaware and New Jersey Issue Updated Fish Consumption Advisories

The Delaware Department of Natural Resources and Environmental Control (DNREC) and the Delaware Department of Health and Social Services revised the state's fish consumption advisory for fish caught in a portion of the tidal Delaware River on October 23. The New Jersey Department of Environmental Protection (NJDEP) followed with a similar action in early November.

The updated advisories are a result of analysis of recent data on chemical contaminants in fish collected from the river, such as PCBs, dioxins and furans, organochlorine pesticides, and mercury. The revised advisories

Additional DRBC water quality program information can be found at www.nj.gov/drbc/programs/quality/.

reflect long-term environmental improvements throughout the Delaware Estuary.

Specifically, the fish consumption advisory for “Upper Zone 5” of the tidal Delaware River, which stretches south from the Delaware/Pennsylvania/New Jersey state lines to the C&D Canal, has been revised from *no consumption of any finfish to eat no more than one eight ounce meal of finfish per year*. The “do not eat” advice remains in place for women of childbearing age and young children.

Delaware coordinates its advisories in waters shared with New Jersey (including the waters affected by this action) with NJDEP. The DRBC also works cooperatively with Delaware, New Jersey, and Pennsylvania to sample fish species representative of the main stem Delaware River to provide data for use by these states in assessing the risk to human health from consumption of fish caught in the river. The DRBC has sampled fish tissue collected at three sites in the non-tidal river above the head of the tide at Trenton, N.J. since 2000

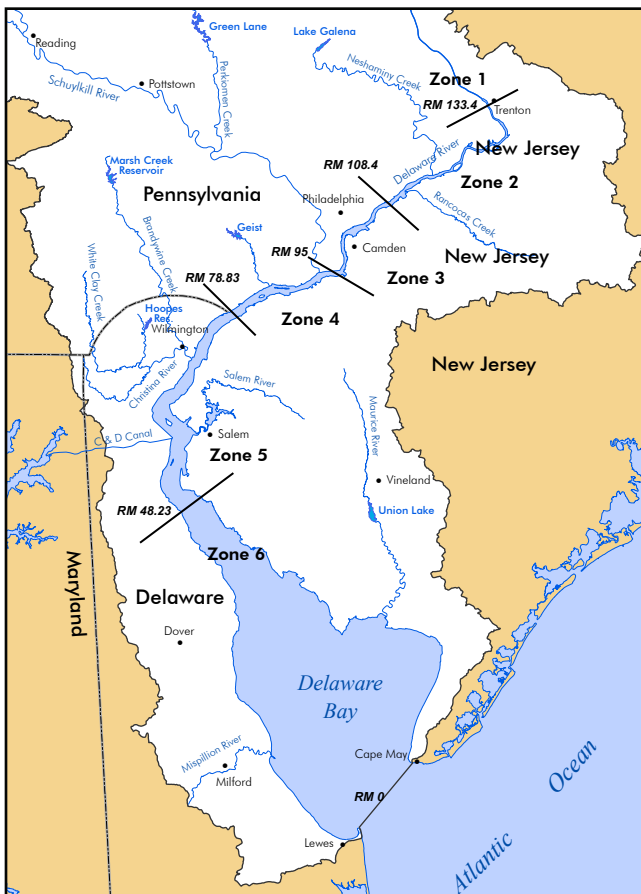
and at five sites in the tidal river since 1991 to follow the trends in contaminant levels. Declining levels of PCBs, the principal contaminant underlying the fish consumption advisories, are responsible for the updated advisories, and reflect the efforts of the DRBC and the states to reduce the loadings of PCBs through the implementation of TMDLs first established in 2003.

Links to basin state-issued fish consumption advisory information can be found on the DRBC web site at www.nj.gov/drbc/quality/fish/.

Delaware Estuary Regional Sediment Management Plan Finalized

Regional Sediment Management (RSM) is a relatively new concept advocated by the U.S. Army Corps of Engineers (USACE). RSM takes a broader, system-wide look at coastal and riverine management activities and their effects within the context of a regional plan. Instead of the USACE managing navigation (principally dredging) projects in isolation, RSM encourages combining and coordinating federal projects from multiple USACE business lines (as well as multiple agencies) to achieve greater environmental and economic benefits. It is widely acknowledged that RSM fully captures the systems approach to project management, a major theme of USACE strategic planning efforts and the Delaware River Basin Water Resources Plan (Basin Plan) adopted by four governors and multiple federal agencies in 2004.

The Delaware Estuary Regional Sediment Management Plan Workgroup (RSMW), of which DRBC is a member, was established in 2009 to develop a better understanding of sediment dynamics and quality in the estuary and to formulate a plan to effectively manage sediment/dredged material on a regional basis to achieve a sustainable balance between ecological and economic activities. The RSMW, which included various federal, state, regional, non-governmental organizations, and commercial entities, finalized its report in August 2013.



The tidal portion of the Delaware River includes DRBC Water Quality Management Zones 2–5 and the Delaware Bay is Zone 6. Zones 2–6 encompass the Delaware Estuary. Zone 1 is the non-tidal Delaware River, which extends from Trenton, N.J. upstream to RM 330.7 at Hancock, N.Y. (RM = river mile)

Restoring the Health of the Delaware Estuary

DRBC Monitoring, Modeling, and Assessment Branch Manager Thomas Fikslin, Ph.D. authored the following article that appeared in the Summer 2013 issue of *Estuary News*, which is published by the Partnership for the Delaware Estuary:

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. 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. 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, 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 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.

To better understand sediment-related estuarine processes, the workgroup investigated four technical areas: 1) Sediment Quantity and Dynamics; 2) Sediment Quality; 3) Dredging and Dredged Material Management; and 4) Restoration and Beneficial Use. White papers were developed for each of these technical areas. The RSMW concluded that implementation of a system-wide approach to the management of sediment and dredged material is critical to sustain the estuarine ecosystem and the economy of the region.

Following the white papers, a set of problem statements, goals, and objectives were developed to address these problems. This led to specific recommendations in seven categories of management activities: 1) Policy Issues; 2) Funding Limitations; 3) Programmatic and Regulatory Issues; 4) Operational Management Concerns; 5) Environmental Management Concerns; 6) Education and Outreach Needs; and 7) Science and Research Needs.

The RSM plan provides a blueprint for all stakeholders concerned about the sustainability of the Delaware River/Estuary to collaboratively address sediment-related problems in a holistic manner. This plan details a shared multi-objective (navigation/commerce, ecosystem restoration, and flood control) management vision for the estuary. It calls for improved communication among stakeholders, better technology to manage impacts from dredging,

sustainable beneficial use of dredged material to meet multiple commercial and ecosystem needs, a better understanding of the processes that impact the sources, transport, and fate of sediment in the system, and more rigorous programs to educate stakeholders and the general public about the importance of sediment/dredged material to the estuary. Implementation of this plan requires cost-benefit accounting across multiple USACE business lines to find the necessary resources to implement and support the plan. The use of RSM will ensure that the benefits from the Delaware Estuary are sustained for future generations.

The complete August 2013 report can be found at www.nj.gov/drbc/library/documents/RSMpaug2013final-report.pdf.

DRBC Completes Lower Delaware River Mussel Survey

In 2000 and 2001, with funding from the National Park Service, the U.S. Geological Survey's Northern Appalachian Research Laboratory (USGS-NARL) conducted comprehensive, qualitative mussel surveys of the Upper Delaware Scenic and Recreational River and the Delaware Water Gap National Recreation Area.

Building on this previously-completed survey work, DRBC and USGS-NARL in 2013 leveraged funding from

the National Park Service and other sources to conduct a study to provide a snapshot of mussel distribution and density in the stretch of river between the Portland-Columbia footbridge (just below the Delaware Water Gap) and the head-of-tide at Trenton, N.J. Since one of the goals of this Lower Delaware survey was to be able to compare findings with the surveys completed in the upper and middle sections of the river, the methods used were similar to those of the 2000 and 2001 surveys.

In the spring of 2013, a DRBC mussel survey team was assembled and trained to properly observe and identify freshwater mussels in the river. Surveys were conducted in three phases throughout the summer of 2013 over a period of seven weeks. The first phase included rapid float surveys, in which a paired team in a canoe paddled downriver and observed whether mussels were present or absent. They would also stop at unique habitat types—*islands, back channels, areas of interest*—and perform spot snorkel surveys to record mussel counts and species identification.



Members of the mussel survey team snorkel the Delaware River. The inset is an underwater photo of the common eastern elliptio mussel found in the riverbed. (Photos by DRBC)

The second phase required intensive, random snorkel surveys completed in 200-meter segments where the survey team moved downriver with the current in 15-minute increments. To do so, team members donned their snorkel gear, held their breath, and dove down. They scanned between rocks, searched amongst aquatic plants, and looked closely at the riverbed.

The third phase was a multi-day intensive snorkel survey to examine diversity and abundance break-points in the Delaware River around the Lehigh River confluence to determine whether there was a difference in counts and species distribution above or below the Lehigh's confluence.

The surveyors found more than 25,000 mussels, or one for every 51 seconds of searching, over the seven-week period. While the most common species was by far the eastern elliptio, five other species were found, as well as juveniles.

Considering that earlier estimates indicated there may be few to no mussels in the non-tidal Lower Delaware River, the results of this survey are a good sign that freshwater mussels are re-establishing in this river section as its water quality improves. Healthy populations of mussels mean better water quality, a healthier ecosystem, and a safer environment for swimming, recreation, and fishing in the largest undammed river east of the Mississippi.

DRBC is in the process of analyzing data collected from the freshwater mussel survey to help determine the best habitat and water quality for different species in the Lower Delaware River. A final report is due to the National Park Service in the spring of 2014.

Additional information, including photos and a five-minute narrated video with underwater footage, can be viewed on the DRBC web site at www.nj.gov/drbc/home/spotlight/approved/20131115_mussels.html.

Why Study Freshwater Mussels?

Did you know that freshwater mussels can live to be 100 years or older? The shells of these centenarians bear the scars of time spent pummeling against boulders and scraping through sand; some may have experienced the Delaware River's Flood of Record in August 1955 or the flood events of the early twentieth century. Three generations back, when George Washington crossed the Delaware in 1776, some mussels may have been "captured" by his troops and punched through with holes to make buttons in a time before plastic.

Today, we understand that freshwater mussels are most valuable alive, living in rivers and streams, lakes and ponds. They stabilize streambeds, especially during floods, provide food and habitat needed by other animals and plants, and, most importantly, as filter-feeders, mussels clean the water in which they live, improving water quality. They suck water in, trap solids (dirt, algae, and other pollutants) in their gills, and then release clean, filtered water back into the water column. Each mussel can filter a gallon of water or more every day. And, since mussels can live a long time, they are also very sensitive to pollution, making them a good indicator of a river or stream's overall health.

Mussels are considered one of the most at-risk animal groups in the U.S., with many species considered threatened or endangered by state and federal governments. The main stem Delaware River persists as a stronghold for Atlantic-slope mussel diversity, including populations of the federally endangered dwarf wedgemussel (*Alasmidonta heterodon*), the state-listed yellow lampmussel (*Lampsilis cariosa*), and high densities of the common eastern elliptio mussel (*Elliptio complanata*). While there has been a good amount of research on freshwater mussels in the upper and middle sections of the Delaware River and its tidewaters, much less is known about mussel populations in the river's lower non-tidal section below the Delaware Water Gap and above Trenton, N.J.

Basin News Briefs

DRBC Remembers Dr. Ruth Patrick

Dr. Ruth Patrick, the world-renowned environmental scientist and Philadelphia-area resident, died September 23 at the age of 105.

Born in Kansas, she lived and worked in the Delaware River Basin her entire professional career. Dr. Patrick was associated with The Academy of Natural Sciences in Philadelphia (which is now affiliated with Drexel University) since 1933.

Dr. Patrick in the 1940s developed a new scientific method to assess the health of freshwater systems (lakes, streams, and rivers) involving the study of changes in the abundance and diversity of plants, animals, and bacteria as a way to measure the impact of pollution and natural changes. She was one of only a handful of female ecologists at the time and her work set the standard still used today for how the environmental health of rivers and streams is evaluated. In 1947, she founded The Academy of Natural Science's Limnology Department, now called the Patrick Center for

Environmental Research, for the study of freshwater bodies.

The Washington Post noted that her work led Congress to pass the 1972 Clean Water Act, which she helped to write. She advised Presidents Lyndon B. Johnson and Ronald Reagan on environmental issues.

“My father used to stand up after dinner and look at me and my sister and say, ‘Remember, you’ve got to leave this world better because you passed this way.’ I have always tried to leave the world a better place through my science.”

– Dr. Ruth Patrick

Dr. Patrick was the recipient of numerous honorary degrees and awards, including the National Medal of Science, our nation's top science award, which she received from President Bill Clinton in 1996.

To honor her extensive contributions to riverine science and management, the DRBC in 2005 named its office building courtyard the “Dr. Ruth Patrick River Garden.” Dr. Patrick, who had just turned 98 years old at the time, attended the ceremony and offered remarks. The river garden

was completed in the summer of 2013. Construction of the courtyard project was made possible thanks to the donations of several admirers and friends of Dr. Patrick, including current and former DRBC commissioners and staff. It will serve as a lasting tribute to a remarkable scientist and a reminder to “leave the world better because you passed this way.”

New Format for Business Meetings and Hearings

The DRBC announced in early 2013 that it would use a new, two-day format for its business meetings and public hearings.

“The commissioners believe this new format will provide them with some additional time to review any public input they may receive on a proposed project before taking action,” Executive Director Carol R. Collier said.

In the past, a public hearing on proposed projects to be considered for approval by the commissioners was held immediately prior to a vote as part of the afternoon business meeting on the same day.

Under the new format that was first used on a pilot basis in March 2013 and continued for the remainder of the year, a public hearing on the proposed permits (referred to as “dockets” by DRBC) and certain resolutions takes place the day prior to the business meeting at which they may be considered for commission action.

Commission consideration at a business meeting on items for



Dr. Ruth Patrick (center) visiting with guests at the 2005 event naming the DRBC's office building courtyard in her honor (Photo by DRBC)

which the public hearing is closed may result in either approval of the docket or resolution as proposed, approval with changes, denial, or deferral. Any deferred items will be considered for action at a public meeting of the commission on a future date.

“State of the Basin” 2013 Update

In May, the DRBC released a summary publication on conditions in the Delaware River Basin. The 16-page booklet provided a quick account of status and trends as well as a set of fast facts for indicators of population and landscape, water use, water quality and species of special concern.

The news is mixed, and hopeful. More than 15 million people—in and out of the basin—depend on basin water, and it is being used more efficiently than in the past. Water continues to be a crucial part of generating electrical power. As demand for electricity increases, so too will the need for water.

After decades of improvement, water quality seems to be holding steady, which is very good. Regulated pollutants are stable or decreasing in concentration. Attention is now being focused on testing for and understanding the effects of a wide array of emerging chemicals of concern.

Striped bass are thriving and horseshoe crabs may be on the rebound. News for oysters and shad is mixed, however, and all but the most common mussels are hard to find in freshwater streams. (*Please*

see the mussel survey article on pages 15-16 for more information.) The Atlantic sturgeon was recently listed as “endangered,” its habitat and survival at risk from both natural conditions and human activity in the river.

On the subject of landscape changes, forested areas disappeared at the rate of 45 football fields per week during the past decade. Natural changes happen more slowly: our bayshore marshes are being eroded or inundated by rising sea levels at a rate of about four football fields a week. Freshwater wetlands and stream corridors are in better condition, especially in the upper basin where more than 70% retain their natural forest cover and function. These natural landscapes are important for water supply and habitat.

The basin continues to be rich in natural resources that provide benefits to us all: water to drink and grow food, streams to canoe and fish, forests to provide clean water, and trails to walk. This is our collective legacy to safeguard for coming generations.

The 2013 publication, which offers links to many background sources for additional information, can be found at www.nj.gov/drbc/programs/basinwide/sotb2013/index.html. The next status and trends report is expected in 2018.

New Online Water Supply Charges Program Reporting System

In January, the DRBC launched a new, online reporting system for

all participants in its Water Supply Charges Program. The new system is designed to simplify surface water use reporting, eliminate the need for paper reports, and generate an invoice for use in submitting payments. It is easier for both end users and DRBC staff since calculations are performed automatically online and the information enters commission databases directly instead of having to be manually entered from paper reports.

Between 1964 and 1974, the commission authorized a system of water supply charges applicable to surface water uses to cover all the costs associated with making the basin water supply available and maintaining its continued availability in adequate quantity and quality over time. Surface water charges provide the revenue stream the commission needs to help repay the debt service and cover operations and maintenance costs for its water supply storage in two federal multi-purpose reservoirs, Beltzville and Blue Marsh. These charges also support DRBC administrative and staff costs related to the protection and preservation of the basin’s water quantity and quality. Storage in Beltzville and Blue Marsh reservoirs is utilized in the commission’s lower basin drought operating plan.

The availability of the online reporting system marks the completion of the first step of a multi-phase technology upgrade by DRBC. Future phases include online acceptance of project applications

and the development of a web portal to easily share electronic information with the public. Details on the reporting system, including step-by-step instructions, can be found on the commission's web site at www.nj.gov/drbc/programs/supply/charging/.

DRBC Publishes New Online Interactive Maps

The commission in October 2013 announced the release of two new interactive maps on its web site that allow the public to access select DRBC docket and permit holder information, as well as certain data from non-tidal Delaware River Basin water quality monitoring locations.

"The creation of these new interactive maps will help DRBC become more transparent, efficient, and better able to share electronic information with the public," Executive Director Carol R. Collier said.

The docket and permit holder information map shows the location of projects approved by DRBC since January 1, 2005 or those currently engaged in the renewal process. When a project is selected on the map, a pop-up menu provides a list of key attributes and a link to view the DRBC approval document.

The water quality monitoring map provides the user with an image of the selected monitoring site (if available) and a link to view a time-series analysis of the monitored parameters. The currently available water quality data are specific conductance results from six real-

time HOBO® monitors deployed in the upper basin as well as barium and strontium data for samples taken from various locations in the non-tidal watershed.

The maps can be viewed via a link on the DRBC home page or directly at www.nj.gov/drbc/basin/map/interactive-map.html.

Natural Gas Update

DRBC Chair Pro Tem Michele Siekerka, who represents New Jersey Governor Chris Christie, issued the following statement at the July 10, 2013 DRBC meeting:

"Let me address how the commission has been moving the natural gas process forward. Since November 2011 DRBC staff and the collective staff of all of the signatory parties have spent thousands of hours:

1. reviewing new scientific studies released on the water resource impacts of natural gas drilling;
2. benchmarking new regulations, best management practices and performance standards adopted by states, federal agencies and organizations such as the Center for Sustainable Shale Development, a collaborative group that has brought environmental and energy interests together;
3. using these models to set a level of minimum standards—a regulatory floor—for natural gas development in the Delaware Basin that will protect the shared water resources on which all the basin states depend;
4. performing water quality and quantity monitoring to establish baseline conditions prior to the onset of natural gas development in the basin; and
5. with the help of a grant from the William Penn Foundation, developing a tool for evaluating the impacts of land-based development on water resources, to facilitate informed planning and assess effects.

I and my colleagues are continuing to confer in good faith and with forward momentum within and outside of our regularly scheduled business meetings to reach consensus on a path forward that provides for the development of a potentially valuable energy source while protecting the vital water resources within the basin."

Learn more by visiting www.nj.gov/drbc/programs/natural/. Individuals may also sign up at www.nj.gov/drbc/contact/interest/ (check the natural gas box) to receive updates via email as new information becomes available.

Accounting for “Lost” Water

DRBC has long recognized the importance and value of using water wisely at all times, not just during times of drought. The commission has an ambitious water conservation program in place, the newest component being its water loss reporting initiative for public water suppliers.

The commission approved a regulation in 2009 requiring public water suppliers to implement the new water audit approach established by the International Water Association and the American Water Works Association (AWWA) beginning with calendar year 2012. This new approach, which reflects the latest thinking in the field of water efficiency, utilizes the AWWA Free Water Audit Software© program for data collection and reporting. The software tracks how effectively water is moved from its source to customers’ taps, helping public water supply systems quantify and account for their water losses.

DRBC conducted multiple outreach efforts, including a one-day workshop held in April 2011, to inform water system operators in the basin about the implementation of the new water audit approach. Water audits are required annually from all public water suppliers within the basin that have been issued approvals by the DRBC to withdraw and use in excess of 100,000 gallons per day.

The electronic-based reporting and improved database functionality allowed staff to assess the status of water audit submissions covering

2012 following the March 31, 2013 deadline. DRBC staff worked on additional outreach to those who did not submit the audit on time and to those who submitted an audit but for which reporting issues were identified. Typically, the audit issues were simple to resolve and in many cases were related to incorrect units being entered in the software or where an audit was submitted but found to be incomplete. In some cases, DRBC staff worked with water utilities directly to provide technical assistance or recommendations for completing the water audit. Based on the experience gained from the first round of reports, the list of Water Audit FAQs on the DRBC web site has been updated to provide additional information that should help users complete future water audit reports. DRBC expects to release the summary results from the first annual data collection in the spring of 2014.

For more information, visit www.nj.gov/drbc/programs/supply/audits/.

DRBC Tweets!

The DRBC began utilizing several social media communication tools in March 2013 to reach a broader audience with news on commission activities and related information. Links to the commission’s Twitter, YouTube, and Flickr social media sites as well as to RSS feeds can be found on the top right corner of every DRBC web page. The commission’s web site, www.drbc.net, remains the agency’s primary

internet presence. In most cases, content posted to DRBC social media sites will also be available on the commission’s web site, and links to relevant web pages will be included in social media posts for those seeking more information on a particular topic.

Over \$350,000 in Grants Awarded to Improve the Schuylkill River Basin

In September 2013, DRBC staff participated in the Schuylkill River Restoration Fund (SRRF) awards ceremony where a total of \$358,821 was distributed to support efforts to improve water quality in the Schuylkill River Watershed. The Schuylkill is the Delaware River’s largest tributary and a source of drinking water for 1.5 million people.

Speakers at the 2013 grant announcement included State Rep. Matthew Bradford (Montgomery-70th District), Schuylkill River Heritage Area Executive Director Kurt Zwinkl, DRBC Water Resources Management Branch Manager Bill Muszynski, Chris Gerdes with Exelon’s Limerick Generating Station, and Kelly Anderson with the Philadelphia Water Department (PWD).

The ceremony took place at the East Norriton Middle School Campus in Norristown, Pa., the site of the completed Stony Creek Restoration Project, a 2011 SRRF grant recipient. This earlier-funded project included stormwater improvements and stream bank stabilization along a section of the

creek that runs through the campus.

The seven projects funded in 2013 will mitigate stormwater runoff, abandoned mine drainage, and agricultural pollution while the three land transaction grants will assist with costs associated with permanent protection of priority watershed parcels. Recipients included the Berks County Conservancy, Montgomery County Conservation District, Partnership for the Delaware Estuary, Schuylkill Headwaters Association, Valley Forge Trout Unlimited, Roxborough Development Corp., Natural Lands Trust, and Wissahickon Valley Watershed Association.

Contributors to the SRRF in 2013 included Exelon Generation, PWD, and Aqua PA. All funds not distributed in 2013 will be rolled over into the 2014 grant round.

The SRRF was previously known as the Exelon Schuylkill River Watershed Restoration Fund, but was renamed to indicate the

expansion from a solely Exelon-funded initiative. It originated in conjunction with a DRBC docket issued to Exelon for its Limerick Generating Station. The SRRF is administered by the Schuylkill River Heritage Area (SRHA). Since the fund was initiated eight years ago, more than \$2 million has been awarded to over 30 projects in the Schuylkill Watershed.

The non-profit organizations and government agencies that receive money annually from the SRRF are selected by a committee comprised of representatives from Exelon, DRBC, PWD, U.S. EPA, Pa. DEP, Partnership for the Delaware Estuary, SRHA, and the Schuylkill Action Network (SAN). SAN is working to expand the fund with additional contributors.

For more information, please visit www.nj.gov/drbc/programs/project/wadesville/schuylkill.html.

“Our Remarkable River”

The 19th Annual Delaware River Sojourn, held from June 22 through June 29, provided participants a wonderful opportunity to enjoy a guided paddling, learning, and camping adventure on and along the Delaware River. A record number of 111 paddlers joined the sojourn on June 23.

Split into daily trips ranging from six to 10 miles, the 2013 sojourn included a total of nearly 60 miles of the main stem Delaware River and a stretch of the Lackawaxen River, a Pa. tributary to the Delaware. From the pristine wilds of the upper

basin, through the tranquility of the Delaware Water Gap, to the suburban lower Delaware and urban tidewaters around Philadelphia, the sojourn offered a full experience of the river to paddlers of all skill levels. Sojourners from as far away as New Mexico participated this year.

The 2013 theme, Our Remarkable River, was based upon the 2012 National Park Service publication, *Delaware River Basin Wild and Scenic River Values*, which highlights the characteristics and values that make the Delaware River worthy of special protection. Sojourners spent six of the eight days paddling on stretches of the Delaware included in the National Wild and Scenic Rivers System.

Sojourners participated in several interesting programs, including tours of the Roebling Aqueduct Toll House, Zane Grey Museum, and the Grey Towers National Historic Site (which celebrated its 50th anniversary in 2013). They also had the opportunity to take a trip on the Steamboat SPLASH, an authentic steam-powered stern wheel paddle boat, and tour the Independence Seaport Museum and its historic ships, the Olympia and Becuna.

By getting individuals out on the river to experience it first-hand, the sojourn aims to promote stewardship of the Delaware River Watershed and its resources. The non-profit, annual event is organized by a steering committee comprised of representatives from federal, state, and local agencies (including the DRBC), non-profit organizations,



DRBC Water Resources Branch Manager Bill Muszynski offers remarks at the 2013 SRRF awards ceremony. Behind him is SRHA Executive Director Kurt Zwinkl. (Photo by Steve Walsh/DRBC)

and individual volunteers. The 2013 committee was chaired by Richard Egan, a volunteer with the National Park Service Upper Delaware Scenic and Recreational River.

Visit www.delawareriversojourn.org for more information.

Schuylkill Action Network: A Decade of Accomplishments

The Schuylkill Action Network (SAN) marked its 10th anniversary in 2013. SAN, of which DRBC is a member, works in partnership with federal, state, and local agencies and governments, local watershed organizations, land conservation organizations, businesses, academics, and water suppliers to transcend regulatory and jurisdictional boundaries in the strategic implementation of protection measures for the Schuylkill River Watershed.

To celebrate a decade of watershed achievements, SAN held a luncheon event in May with presentations,

speakers, awards, and networking at the John James Audubon Center at Mill Grove in Audubon, Pa. Keynote speakers included Peter Grevatt, Director of the EPA Office of Groundwater and Drinking Water, and EPA Region 3 Administrator Shawn Garvin. DRBC Executive Director Carol R. Collier offered closing remarks and expectations for the next ten years.

In the past decade, SAN partners have helped to guide the leveraged investment of more than \$400 million and completed hundreds of projects that addressed agricultural runoff and stormwater management, reduced the impacts of abandoned mine drainage, and upgraded infrastructure, including the elimination of unpermitted discharges. Also notable is the development of an Early Warning System for timely notifications of spills.

Additional information can be found on SAN's web site at www.schuylkillwaters.org.

In Memory of Senator Lautenberg

Frank R. Lautenberg, New Jersey's senior senator, died June 3 at the age of 89. Serving his fifth term in the U.S. Senate, Frank Lautenberg was a true friend of the Delaware River and the DRBC.

In June 1999, Senator Lautenberg introduced legislation, which was signed into law by President Bill Clinton in 2000, adding a 38.9-mile section of the main stem Delaware (and about 28 miles of selected tributaries) to the National Wild and

Scenic Rivers System. As a result of this law—known as the Lower Delaware Wild and Scenic Rivers Act—and two previous designations enacted in 1978, three-quarters of the non-tidal Delaware River is now included in the national system. The 2000 law helped pave the way for the DRBC to permanently designate the Lower Delaware as Significant Resource Waters under the commission's Special Protection Waters (SPW) program in July 2008. The entire 197-mile non-tidal Delaware River is now protected by the DRBC's SPW anti-degradation regulations.

Senator Lautenberg was an original cosponsor of another bill, which was signed into law by President George W. Bush in 2006, designating 24.2 miles of the Musconetcong River, a New Jersey tributary of the Delaware River, as a component of the National Wild and Scenic Rivers System.

Senator Lautenberg was a strong advocate for restoring the federal contribution to help support the DRBC's annual operating budget as required by the Delaware River Basin Compact. He worked with Senate and House colleagues in the successful effort that led to federal funding to support the DRBC's operating budget in 2009 for the first time since 1996.

In addition, Senator Lautenberg helped to obtain congressionally directed funding towards enhancing the Delaware River Basin's Flood Warning System following the floods of 2004, 2005, and 2006. These



SAN Coordinator Tom Davidock and DRBC Executive Director Carol Collier at the SAN anniversary celebration. (Photo courtesy of the Partnership for the Delaware Estuary)

efforts will continue to benefit basin residents for years to come.

UDC Celebrates Its 25th Anniversary



The Upper Delaware Council (UDC) marked its 25th anniversary in 2013. It was established in

1988 to facilitate local participation in natural and cultural resource conservation and protection of the Upper Delaware Scenic and Recreational River, which was designated by President Jimmy Carter and the U.S. Congress in 1978 as the 19th component of the National Wild and Scenic Rivers System. The creation of the UDC as an alternative to sole federal management of the 73-mile river corridor was a critical recommendation of the River Management Plan for the Upper Delaware Scenic and Recreational River. Its role in overseeing the various stakeholders tasked with implementing the River Management Plan's goals and objectives represents a working partnership that has been recognized both locally and nationally.

The UDC's voting members include the two states (New York and Pennsylvania) and 13 of the 15 local governments which border on the Upper Delaware River. The DRBC serves as a non-voting member. Visit www.upperdelawarecouncil.org for more information.

People News

The DRBC works with numerous agencies and organizations, and notes the following personnel changes that occurred among them during 2013:

- Robert R. Mason, Jr. assumed the duties of the Delaware River Master in February, succeeding Stephen F. Blanchard who retired. The U.S. Geological Survey's (USGS) Office of the Delaware River Master was established by the U.S. Supreme Court Decree of 1954 to ensure that the provisions of the decree are met. He also is the acting chief of the USGS Office of Surface Water headquartered in Reston, Va. Additional information can be found online at water.usgs.gov/osw/odrm.
- Paul O. Swartz, who served as executive director of the Susquehanna River Basin Commission (SRBC) since 1992, retired in September. His successor is Andrew D. Dehoff, who has held progressively responsible positions with SRBC since 1995. Visit www.srbc.net for more information about the commission.

SWIM Delaware Bay 2013

Meghan Wren's dedication to the Delaware Bay's history, culture, and environment is quite evident. In 1988, she founded a non-profit organization now known as the Bayshore Center at Bivalve and started a crusade to restore the A.J. Meerwald, a historic oyster

schooner which was designated in 1998 as New Jersey's official tall ship. During the multi-year effort organized by the DRBC that led to the successful completion of the *Water Resources Plan for the Delaware River Basin* in 2004, Meghan served on the Watershed Advisory Council's Steering Committee and the Education and Stewardship Committee that played key roles in forging the 30-year, goal-based framework.

On August 3, 2013, she became the first person to successfully swim the 13.1 mile route across the Delaware Bay from Port Mahon, Del. to Fortescue, N.J. This extraordinary effort took about eight hours and 45 minutes.

She undertook the challenge "... for the Delaware Bay and for its people. We have an amazing place here, and I don't think it gets enough attention, or enough investment [for] the future."

Additional information can be found at www.bayshorecenter.org.



The SWIM Delaware Bay 2013 logo (Courtesy of the Bayshore Center at Bivalve)

Financial Summary

DRBC's financial records are audited annually as required by the *Delaware River Basin Compact* and are available for inspection, upon request, at the commission's West Trenton headquarters.

“The respective signatory parties covenant and agree to include the amounts so apportioned for the support of the current expense budget in their respective budgets next to be adopted, subject to such review and approval as may be required by their respective budgetary processes.”

Delaware River Basin Compact (Public Law 87-328, Section 13.3c)

This annual report covers calendar year 2013 (January 1–December 31), which differs from DRBC fiscal years extending from July through June. As a result, portions of two fiscal years comprise this 2013 annual summary.

DRBC Fiscal Year 2013 (July 1, 2012 – June 30, 2013)

During FY 2013, New Jersey and Delaware each paid their full fair share of \$893,000 and \$447,000, respectively.

Pennsylvania's payment totaled \$948,350 or \$100,000 above the amount in the adopted DRBC budget. Pennsylvania has indicated that it plans to make up a \$400,000 FY 2012 shortfall and the extra payment of \$100,000 in FY 2013 was the first installment towards meeting this goal.

New York's payment of \$246,000 was \$388,000 below its 17.5% full fair share. No federal contribution to support the DRBC's current expense budget was received during FY 2013, and has only been provided once since October 1, 1996. The cumulative federal shortfall from October 1996 through June 2013 totaled \$10,709,250.

Under the tacit agreement reached by the commission members in 1988 to apportion signatory party contributions, the annual full payments would have been Pennsylvania \$893,000 (25%), New Jersey \$893,000 (25%), federal government \$715,000 (20%), New York \$626,000 (17.5%), and Delaware \$447,000 (12.5%).

DRBC Fiscal Year 2014 (July 1, 2013 – June 30, 2014)

Following the public hearing held a day earlier, the commissioners on May 8, 2013 unanimously approved the DRBC's current expense budget of \$5,647,550 for the fiscal year ending June 30, 2014. It calls for the following signatory member contributions:

Pennsylvania \$848,350, New Jersey \$693,000, federal government \$715,000, New York \$246,000, and Delaware \$447,000.

Editor's Note: Pennsylvania's actual payment for the fiscal year ending June 30, 2014 totaled \$998,350, or \$150,000 above the amount in the adopted budget. This is the second extra payment intended to make up for the \$400,000 shortfall in FY 2012. The federal government's actual FY 2014 payment was \$0. Delaware, New Jersey, and New York each contributed the amount included in the adopted DRBC budget.

In addition, the commissioners approved the DRBC capital budget (Water Supply Storage Facilities Fund), providing for expenditures of \$3,820,400.

DRBC Fiscal Summary - Agencywide for Fiscal Year Ending June 30, 2013

Revenues:	
Signatory Contributions	\$2,534,350
Grants & Special Projects	2,124,299
Surface Water Supply Charges	3,314,826
Project Review Fees, Investment Income & Other	1,449,285
Expenses:	
Salaries & Benefits	\$4,929,701
Operating Expenses	2,996,223
Debt Service & Depreciation	1,626,548
Building Improvements/Equipment Acquisition	671,869

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