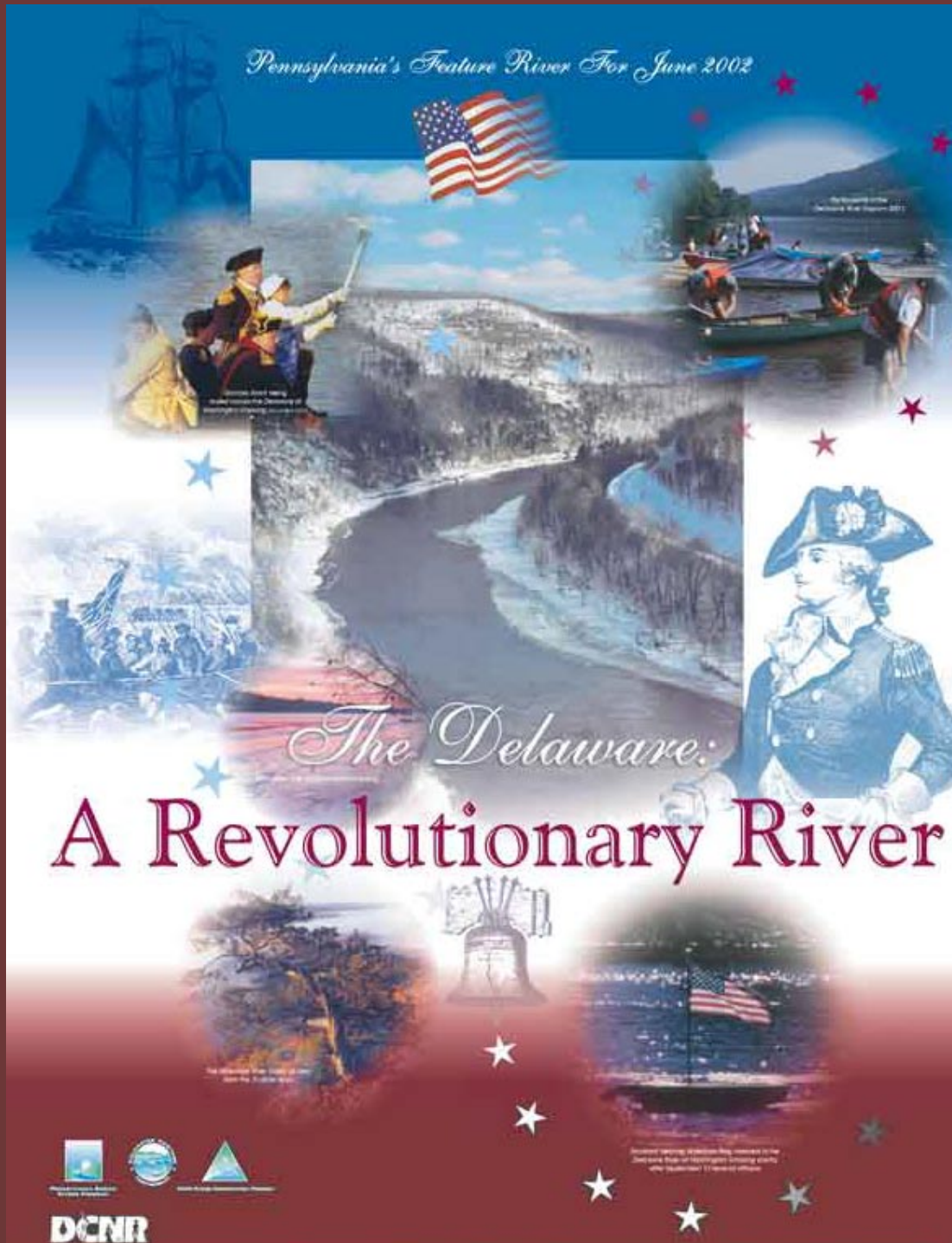


Delaware River Basin Commission



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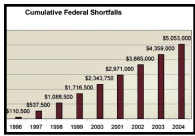


The Delaware River Basin Commission (DRBC) is an interstate/federal agency that manages the water resources within the 13,539-square-mile basin covering portions of Delaware, New Jersey, New York, and Pennsylvania. This publication covers calendar years 2002 and 2003, and was produced by the DRBC's Public Information Office, with the valuable assistance of numerous commission staff.

This report is available on the commission's web site at <http://www.drbc.net>. Free copies are available upon request by contacting the DRBC by mail (P.O. Box 7360, West Trenton, NJ 08628), phone (609-883-9500) or e-mail (denise.mchugh@drbc.state.nj.us).

About the cover: The commemorative poster pictured here was created by the Pennsylvania Department of Conservation and Natural Resources in honor of the Delaware being named as Pennsylvania's "Feature River of the Year" in 2002. The poster featured the theme of that year's sojourn, "The Delaware: A Revolutionary River," and included photos provided by the DRBC.

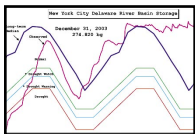
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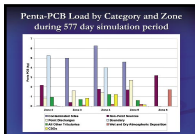
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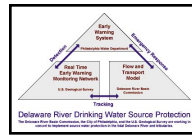
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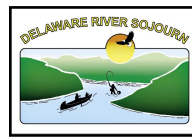
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Letter from the Executive Director



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Carol R. Collier
Executive Director

Robert Tudor
Deputy Executive Director

Spring 2004

Dear Friends:

As only the third person to serve as the commission's executive director, I am very proud of the accomplishments that have been achieved by our commissioners and dedicated staff over the agency's 43-year history. Many of these successes would not have been possible without the valuable assistance of our public and private partners too numerous to mention. Our projects and activities are truly "team" efforts. The title of one of the commission's publications, "A River Bounces Back," is a theme we can all celebrate together.

However, I must tell you that the commission's ability to meet the many challenges that lie ahead for the Delaware River Basin and the nearly 15 million people it serves in Delaware, New Jersey, New York, and Pennsylvania is in serious jeopardy.

In the 100-year compact that created the DRBC, our five signatory parties (the four basin states and the federal government) agreed to support the commission's annual budget. The federal government adhered to this obligation for 35 years, paying its 20 percent share of the DRBC's annual operating budget. Then in 1996 (and continuing to the present), the U.S. Congress ended its support of the DRBC's budget while the federal government remained an active voting commission member possessing the same powers and authority as the other signatory parties, including the opportunity to chair the agency.

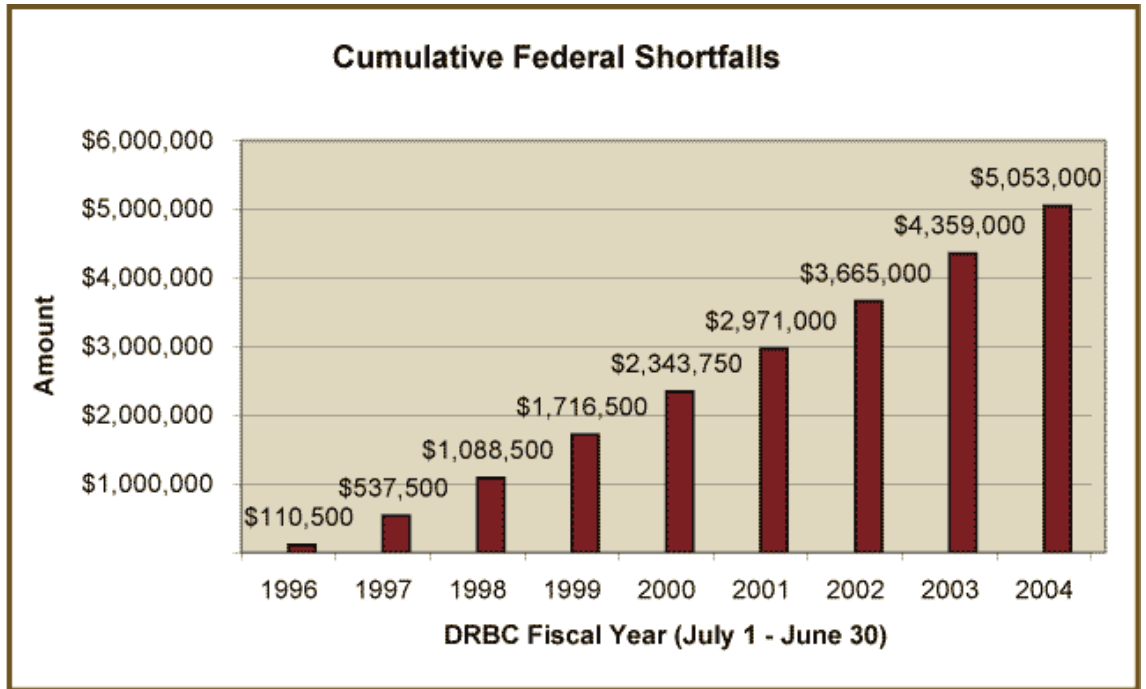
Since October 1, 1996, the commission has continued, and in some cases even expanded, its many important duties relating to interstate flow and drought management, pollution control, watershed planning, flood protection, permitting, and education/outreach without federal support of its annual operating budget. In some cases, we were able to obtain grant funding. We also realized some savings due to staff turnover (including retirements of long-time employees) and by not filling some authorized positions. For the most part, however, we dipped into our "rainy day" reserves. The cumulative federal shortfall has reached \$5 million, about the size of the commission's fiscal year 2005 budget, and the reserves are nearly gone.

Unless the federal government again honors the commitment made by President Kennedy and the 87th Congress in 1961 to support the DRBC's annual operating budget, the commission faces cutbacks to vital programs that have helped preserve and protect a major regional water supply for the past 43 years . . . programs that now address homeland security and other issues that are vital to the economic health and safety of our watershed. Additional information about the areas facing budget cuts can be found on the DRBC web site at <http://www.nj.gov/drbc/budget.htm>.

U.S. Senator Arlen Specter from Pennsylvania is leading the charge to restore federal funding, and his efforts in the fall of 2003 came close to being successful. He has pledged to try again this year and we are very grateful to him, U.S. Senator Tom Carper from Delaware (a former DRBC commissioner), U.S. Representative Jim Gerlach from Pennsylvania, and the other members of the U.S. Senate and House who support federal funding restoration. But time is running out before we are faced with painful decisions.

The passage of the compact creating the DRBC was a bold, new idea: the first time in our nation's history that the federal government and a group of states joined together as equal partners in a river basin planning, development, and regulatory agency. In a March 2003 *New York Times* article, "A New Frontier in Water Wars Emerges in East," the DRBC was described as "What is widely viewed as the most successful model of a cooperative effort" in interstate watershed management.

The commission's compact has been used as a model in the creation of other federal/interstate commissions in the United States. And our work has caught the eye of other river managers around the world. Delegations from Sri Lanka, Uganda, China, and South Korea traveled to West Trenton in 2002 and 2003 to meet with us. We do not seek them out, but they somehow find out about the DRBC and ask to meet with our staff to learn from us. I have been



asked to be a U.S. representative on an international team tasked with providing river basin management strategies to the People's Republic of China. This effort is fully funded by the Japanese. It is ironic to me that other nations seem to admire our approach to water resources management more than some officials in our own country.

If you believe the DRBC should continue its efforts in projects such as reducing the amount of PCBs and other toxics in the Delaware River, flood loss reduction, river flow management and fisheries protection, possible expansion of the Special Protection Waters regulations into the Lower Delaware region, water quality monitoring/analysis, interstate watershed partnerships, timely reviews of project applications, and public education/outreach – *and I hope you do* – it is time for your U.S. representative and senators to hear from you in support of restoring the DRBC's federal funding. We will continue our efforts with the basin's congressional delegation, but they need to hear directly from you, their constituents. Since the September 11 attacks and subsequent anthrax incidents, the U.S. mail is still very slow to arrive on Capitol Hill because of necessary precautions, so it is best to contact your legislators by e-mail, phone or fax. If you are unsure who represents you or how to get in touch with them, please visit the DRBC web site at <http://www.nj.gov/drbc/USReps.htm>.

I know that our efforts will have a greater chance for success if we work together.

Our basin state governors and their alternates on the commission have been very supportive and I thank them for their ongoing efforts. I also am grateful to the many individuals and organizations who have already contacted their federal legislators in support of DRBC funding.

This report is covering two years in an effort to reduce costs due to our budget crisis. I encourage you to regularly visit our web site at <http://www.drbc.net> throughout the year for useful and timely information, as well as use the many web links appearing in this report. I hope you enjoy reading it.

Sincerely,

Carol R. Collier
Executive Director

Signatory Members



Brigadier General
M. Stephen Rhoades



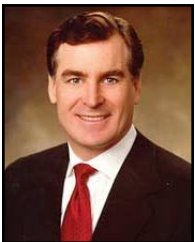
Brigadier General
Merdith W. B. Temple



New York Governor
George E. Pataki



New Jersey Governor
James E. McGreevey



Pennsylvania Governor
Mark S. Schweiker



Pennsylvania Governor
Edward G. Rendell



Delaware Governor
Ruth Ann Minner

The years 2002 and 2003 witnessed numerous changes to the dedicated public officials serving as members and alternates to the commission.

New Jersey

James E. McGreevey was sworn in as the new governor of New Jersey in January 2002. Governor McGreevey designated Department of Environmental Protection (DEP) Commissioner **Bradley M. Campbell** and DEP Assistant Commissioner for Environmental Regulation **Samuel A. Wolfe** as his alternate and second alternate, respectively. Water Supply Administrator **Dennis Hart** served as his third alternate until July 2002 when the governor named DEP Assistant Commissioner for Land Use Management **Ernest Hahn** as his new choice following DEP's internal reorganization.

Pennsylvania

Pennsylvania was led by two governors during this two-year period. **Mark S. Schweiker** served as governor until January 2003 when **Edward G. Rendell** began his term as the commonwealth's new chief executive.

Irene B. Brooks resigned her position as Governor Schweiker's alternate after the U.S. Senate confirmed her nomination by President George W. Bush in the fall of 2002 to serve as a commissioner on the International Joint Commission (IJC). The IJC is an independent, six-member binational organization established by the Boundary Waters Treaty of 1909 to help prevent and resolve disputes relating to the use and quality of boundary waters between Canada and the United States and to advise the two countries on related questions. Irene had served since April 1995 as the Pennsylvania

alternate to the DRBC under Governors Schweiker and Tom Ridge. She also held the position of federal representative to the DRBC under President George Bush from September 1989 to March 1994.

Governor Rendell briefly appointed Acting DEP Deputy Secretary for Water Management **John Hines** as his alternate before selecting DEP Office of River Basin Cooperation Executive Director **Cathleen Curran Myers** as his appointee to the commission in April 2003 (Ms. Myers is now DEP Deputy Secretary for Water Management). DEP Bureau of Watershed Chief **William Gast** was appointed by the governor as his second alternate, a post he also held under Governors Schweiker and Ridge. Philadelphia Water Commissioner **Kumar Kishinchand** continued to be the advisor to the Pennsylvania DRBC commissioner.

Delaware

Delaware Governor **Ruth Ann Minner** had two different alternates to the DRBC over this two-year period. Department of Natural Resources and Environmental Control (DNREC) Secretary **Nicholas A. DiPasquale**, who served as the governor's alternate to the DRBC since she took office in 2001, left her administration in 2002. In January 2003, Governor Minner selected her new DNREC Secretary, **John A. Hughes**, as her DRBC alternate. **Kevin C. Donnelly** and **Harry W. Otto** continued to serve as the governor's second and third alternates, respectively.

New York

New York Governor **George E. Pataki** replaced long-time representatives to the commission in 2002 and 2003. **N.G. Kaul**, who

served as the governor's alternate on the commission since 1995, retired from New York State's Department of Environmental Conservation (DEC) in 2002 after 27 years to begin a new career with the U.S. Environmental Protection Agency. (*Editor's note: Sadly, cancer took Mr. Kaul's life in February 2004*). **Warren T. Lavery**, who worked in DEC's Division of Water since joining the agency in 1982, retired in March 2003 after serving as Governor Pataki's second alternate on the DRBC since 1995. Mr. Lavery briefly returned for about five months in 2003 as the commission's Tri-State Watershed manager before truly beginning retired life. The governor appointed DEC Commissioner **Erin M. Crotty** as his alternate in 2003, along with Division of Water Director **Sandra Allen** and Assistant Director **Fred Nuffer** as his second and third alternates, respectively. New York City Mayor Michael R. Bloomberg in April 2002 designated his new DEP Commissioner, **Christopher O. Ward**, to replace **Joel A. Miele, Sr.** as the advisor to the New York State DRBC commissioner.

Federal Government

The federal government's DRBC representative, **Brigadier General M. Stephen Rhoades**, named the U.S. Army Corps of Engineers' newly assigned Philadelphia District Engineer, **Lieutenant Colonel Thomas C. Chapman**, as his second alternate to the commission in July 2002, replacing **Lt. Col. Timothy Brown** who was reassigned to another post. In response to the retirement of Brig. Gen. Rhoades in January 2003, President George W. Bush appointed **Brig. Gen. Merdith W. B. Temple**, the new commander of the Corp's North Atlantic Division, as the federal representative

in February 2003. **Col. John P. Carroll** and Lt. Col. Chapman continued as Brig. Gen. Temple's alternate and second alternate, respectively.

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 five signatory parties.

July 1, 2002 through June 30, 2003

Pennsylvania Governors Schweiker and Rendell split the duties of commission chair during this period. New Jersey Governor McGreevey and New York Governor Pataki were elected vice chair and second vice chair, respectively.

Delaware Governor Minner was the fourth commission member while Brig. Gen. Rhoades and Temple served as the federal representative at different times over the year.

July 1, 2003 through June 30, 2004

New Jersey Governor McGreevey was elected the new commission chair at the June 26, 2003 commission meeting. New York Governor Pataki and Delaware Governor Minner were selected to serve as vice chair and second vice chair, respectively. The remaining two commission members during this period were Brig. Gen. Temple and Governor Rendell.

The current list of commission members and their alternates can be viewed at <http://www.nj.gov/drbc/commiss.htm>.

Commission Staff

Please note that all staff e-mail addresses have changed to a new format: first name.last name@drbc.state.nj.us.

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

Staff Goodbyes

Eleven employees said farewell to the commission during 2002-2003, including seven by retirement. Five of the retirees had over 140 years of combined exemplary service:

Warren Huff – Warren retired in 2003 bringing to a close his 36-year-career with the DRBC. He joined the commission's Water Quality Branch in 1967 as a technician and most recently served as head of its Information Services Branch.

Richard Tortoriello – “Doctor T,” who also retired in 2003, was hired by the DRBC in 1968 as a water resources engineer in the Water Quality Branch, and he advanced to head of the commission's Operations Branch, a post he held for 20 years.

Susan Owens – Susan retired in 2003 just shy of reaching her 30-year anniversary with the DRBC. She held a number of different positions over her commission career and most recently served as its graphic designer. Susan continues to help the commission with its graphics design work several hours a week.

Judy Scouten – Judy retired in 2003 after celebrating her 25th year with the commission. Her most recent position was secretary to commission secretaries Pamela Bush and Susan Weisman.

Anne Zamonski – Anne retired in 2003 with over 20 years of DRBC service. She was the secretary to two executive directors, Carol R. Collier and Gerald M. Hansler, and also served as the secretary to the deputy executive director since the creation of that position in 1998.

Other retirees in 2003 included Network Administrator **Timothy Lazaro** (over 13 years with the DRBC) and Project Review Branch Secretary **Peg Lebo** (just shy of six years of service).

Also leaving the staff were Project Review Branch Head **Thomas Brand** (2003), Delaware Estuary Program Director **Forsyth Kineon** (2002), and Acting Planning and Implementation Branch Head **Lance Miller** (2002).

Promotions

- **Richard Fromuth**, *Operations Branch Head, 2003.*
- **Hernan Quinodoz**, *Senior Engineer/Hydrologist, Operations Branch, 2003.*
- **Donna Woolf**, *Executive Assistant, Directorate, 2003.*
- **Karl Heinicke**, *System Administrator/Data Manager, Information Services Branch, 2003.*

New DRBC Hires

- **Kenneth Najjar**, *Planning and Implementation Branch Head, 2002.*
- **Alysa Suero**, *Geologist, Project Review Branch, 2002.*
- **Victoria Lawson**, *Secretary, Planning and Implementation Branch, 2002.*
- **Paula Schmitt**, *Secretary, Directorate, 2003.*
- **Peter Evans**, *Delaware Estuary Program Director, Directorate, 2003.*
- **Sherry Garrahan**, *Secretary, Operations and Information Services Branches, 2003.*
- **Robert Klosowski**, *Water Resources Engineer, Operations Branch, 2003.*
- **Lisa Hipp**, *Secretary, Project Review Branch, 2003.*



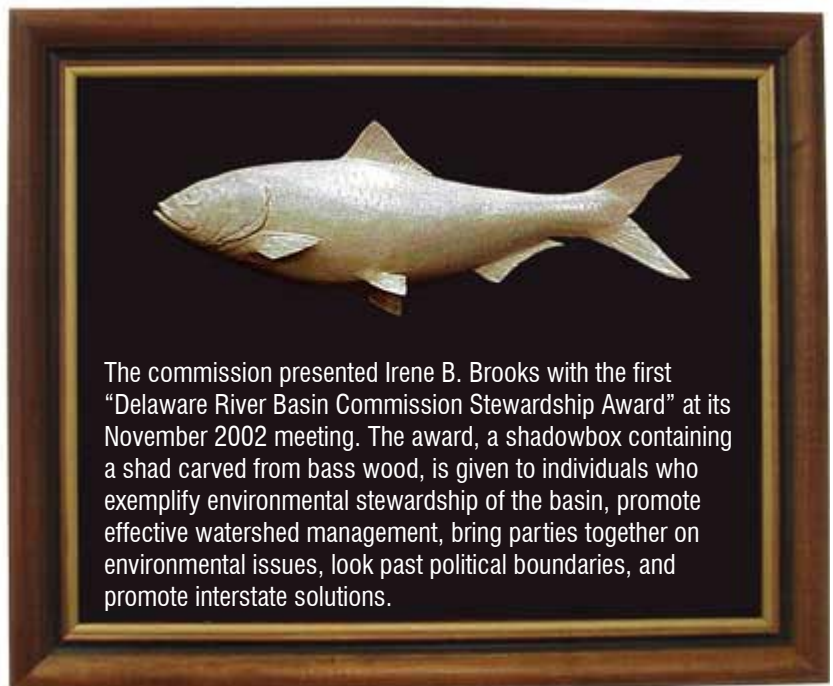
(from left to right) Dick Tortoriello, Anne Zamonski, Peg Lebo, and Tim Lazaro getting ready to cut their retirement cake. (Photo by Clarke Rupert)

More People News

- Executive Director Carol R. Collier announced in December 2003 that William J. Muszynski will be serving as the commission's Coordinator of Special Projects and Programs beginning in January 2004. Muszynski is being temporarily assigned to the DRBC for a two-year period while remaining an employee of the U.S. Environmental Protection Agency (EPA). His most recent EPA position was Deputy Regional Administrator for Region 2. Specific projects and programs are expected to include: participating in various aspects of Stage 2 PCB Total Maximum Daily Load (TMDL) development, implementation, and funding; developing a framework for water quality trading; and overseeing the update and refinement of the commission's comprehensive plan. Muszynski also will lead the DRBC's project review branch.
- On October 1, 2002, New Jersey held a dedication ceremony to rename its transportation building after the commission's long-time general counsel and the state's first transportation commissioner, David J. Goldberg, who died in 2001.
- Robert C. Johnson, a U.S. Army Corps of Engineers civilian staff liaison to the commission, announced his retirement from the Corps in December 2003 after 33 years of service. Christine Bethke was named as his replacement.
- The DRBC was saddened to lose two friends during July 2003. New York State Assemblyman Jacob E. Gunther III, one of the commission's best advocates for the upper basin, died from cancer at the age of 50 (*the voters of the 98th Assembly District in November elected Aileen Gunther to fill the vacancy created by the untimely death of her husband*). Later that month, former DRBC chief engineer and operations branch head Robert L. Goodell died. He spent 32 years

in water resources management, including 25 years with the commission, and was instrumental in shaping the basin's long-term water supply programs.

- Van Dyke Polhemus died in December 2003 after a lengthy illness. In addition to working as a consultant to the DRBC on river flow issues, he was an active participant in the commission's Level B Study, which in the late 1970s and early 1980s examined alternative ways of providing an adequate water supply during droughts. This study laid the technical foundation for the "Good Faith Agreement" which was adopted in 1983 by the DRBC and the parties to the 1954 U.S. Supreme Court Decree.



The commission presented Irene B. Brooks with the first "Delaware River Basin Commission Stewardship Award" at its November 2002 meeting. The award, a shadowbox containing a shad carved from bass wood, is given to individuals who exemplify environmental stewardship of the basin, promote effective watershed management, bring parties together on environmental issues, look past political boundaries, and promote interstate solutions.

Hydrologic Summary 2002-2003

A Story of Extremes

If you believe that “normal” weather is simply an average of weather extremes – droughts, floods, tornadoes, hurricanes, snowstorms, and other hydrologic calamities – then the Delaware River Basin’s weather over the two-year period of 2002-2003

was quite normal. However, those people who saw their wells go dry or their homes and streets flooded may certainly disagree with this description.

Here is a summary of what happened in 2002 and 2003 throughout the basin, including some of the actions taken by the

commission in response to the sharply contrasting weather patterns of Mother Nature.

2002

The drought that began during the summer of 2001 continued unrelenting into 2002. The new year began with the Delaware River Basin still under the drought emergency declared by the DRBC on December 18, 2001, and the majority of the counties within the basin were under state-declared drought actions.

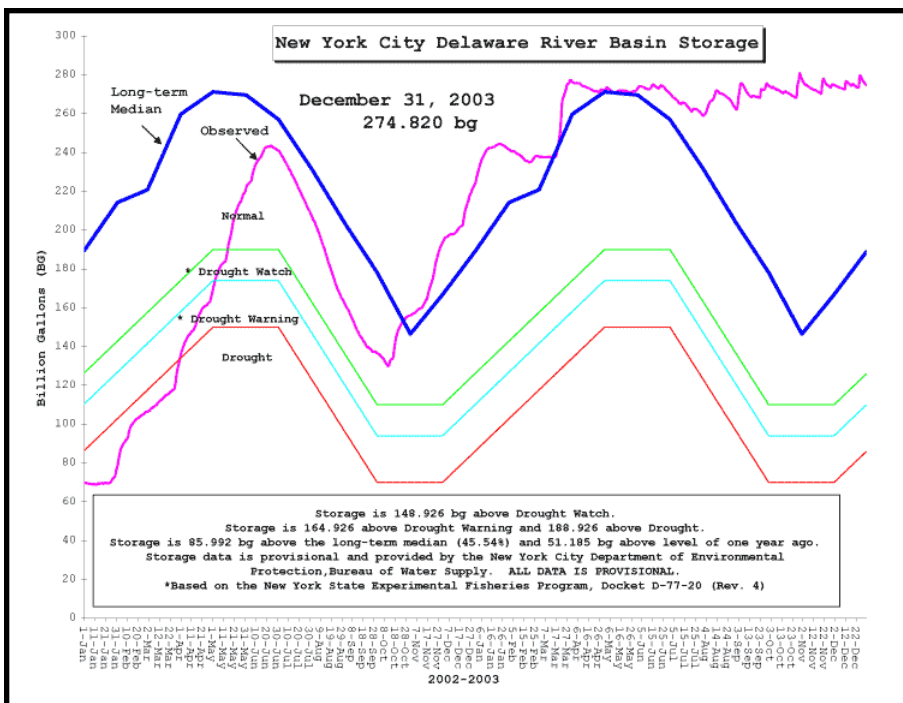
Below-normal precipitation persisted throughout January and into February. February was a

particularly dry month, setting records in Philadelphia and Allentown, Pa. Much needed relief arrived in early spring when normal-to above-normal rainfall patterns returned to the basin. Stream levels rose, reservoirs made gains in storage, and ground water in many wells began a seasonal, upward trend. By April 1, a combination of rainfall and snowmelt caused the New York City Delaware reservoirs to rise above the drought threshold for the first time since November 2001. As a result of this improved storage, normal flow objectives at Montague, N.J. and Trenton, N.J. as well as normal out-of-basin diversions to New York City and northern New Jersey resumed on May 26. However, the DRBC’s December 2001 drought declaration, which authorized the commission’s use of emergency reservoir storage totaling 69 billion gallons (bg), remained in effect.

Although the DRBC Water Code would have allowed the commissioners to lift the drought emergency in early July, they unanimously decided on a number of occasions to continue the declaration due to a persistent dry weather pattern during the summer.

This dry pattern broke by early autumn and ample rainfall returned to the basin by the end of September. Although the drought indicators were showing signs of improvement, another period of dry weather could have easily wiped out any gains. Fortunately, drought indicators across the basin continued to show signs of improvement throughout the remainder of the autumn. The improved hydrologic conditions resulted in the commissioners terminating the basinwide drought emergency at their November 25, 2002 meeting.

DRBC’s drought operating plan saved approximately 43 billion gallons in reservoir storage during the drought of 2001-2002.



This graph shows the actual combined water storage in the Cannonsville, Neversink, and Pepacton reservoirs on the last day of 2003. It also illustrates the water storage extremes observed over 2002 and 2003.

Ample rainfall continued through the end of the year, prompting the lifting of various state-declared drought actions as well.

For additional information about 2002 hydrologic conditions, including a timeline of drought declarations and actions, please visit the DRBC web site at <http://www.nj.gov/drbc/02hydrorep.htm>.

2003

The drenching of 2003 made the drought of 2001-2002 a distant memory. In a December 30, 2003 article appearing in the *Trenton Times*, New Jersey state climatologist and Rutgers University professor David Robinson said, "It's the fourth wettest year since 1895." He added, "And 2001 was the fourth-driest year on record."

In 2002, about 47 bg of water was released from the Cannonsville, Neversink, and Pepacton reservoirs at the Delaware's headwaters in New York State to meet minimum flow targets on the river at Montague, compared to over 100 bg in 2001. In 2003, directed releases dropped to only 3 bg. However, an incredible 371 bg of water spilled out of the filled reservoirs in 2003, or 100 bg more than their entire combined usable storage!

The winter of 2003 saw generally above-average snowfall in the basin. The President's Day Weekend snow storm in February built up the basin's snow pack to its highest level since January 1996 when a record-breaking snowfall, followed by heavy rain and unseasonably warm temperatures, produced extensive flooding in the basin. The heavy snow pack and a forecast for warmer temperatures and rain in late-February prompted the DRBC to issue a news release

The DRBC created a new web page called, "Tips on Finding Information During Periods of High Flood Potential" that directs basin residents to useful National Weather Service and other agency web sites. You can find it at http://www.nj.gov/drbc/Flood_Website/tips.htm.

due to the increased flood potential. Fortunately, flooding did not occur, but the information contained in the release, such as links to snow pack monitoring by the National Weather Service, will hopefully continue to be useful to basin residents in future winters. The news release can be found at http://www.nj.gov/drbc/newsrel_floodpotential.htm on the DRBC's web site.

June and September were particularly rainy months. In fact, September gave the basin not only substantial rainfall, but also floods, four confirmed tornadoes (three in New Jersey and one in Pennsylvania), and a hurricane. Thunderstorms with up to 10 inches of rain caused severe flooding in the Christina River Subbasin that drains portions of Delaware and Pennsylvania just days prior to the arrival of Hurricane Isabel. Fortunately, Isabel lost much of her intensity as the storm tracked to the west of the basin on September 18 and 19, leaving more wind than rain in its path. Nevertheless, the hurricane caused moderate flooding along the Christina River and a tidal surge up the Delaware Bay produced moderate- to severe-tidal flooding. Several days following Isabel, storms that produced the four tornadoes also dropped two- to three-inches of rain

on parts of the basin. This rainfall, in combination with the already saturated ground and higher than normal streamflows, triggered flash floods in the Tannersville and South Whitehall areas of northeastern Pa. Additional flooding occurred along the Brandywine and Christina rivers, as well as the Red Clay and White Clay creeks. The average daily streamflow of the Delaware at Montague during September was 12,724 cubic feet per second (cfs), or nearly 600 percent of normal!

The heavy rainfalls that continued throughout much of the fall resulted in flooding along stretches of the Neshaminy and Assunpink creeks, in addition to many of the lower basin tributaries already mentioned.

More detailed hydrologic information can be found on the DRBC web site at <http://www.nj.gov/drbc/hydro.htm>.



A view of the Delaware River spilling over its bank at Washington Crossing State Park, N.J. on October 30, 2003. Following very heavy rainfall, the river was flowing at about 79,000 cfs at the nearby Trenton stream gage, compared to a mean daily flow of 7,326 cfs. (Photo by Clarke Rupert)

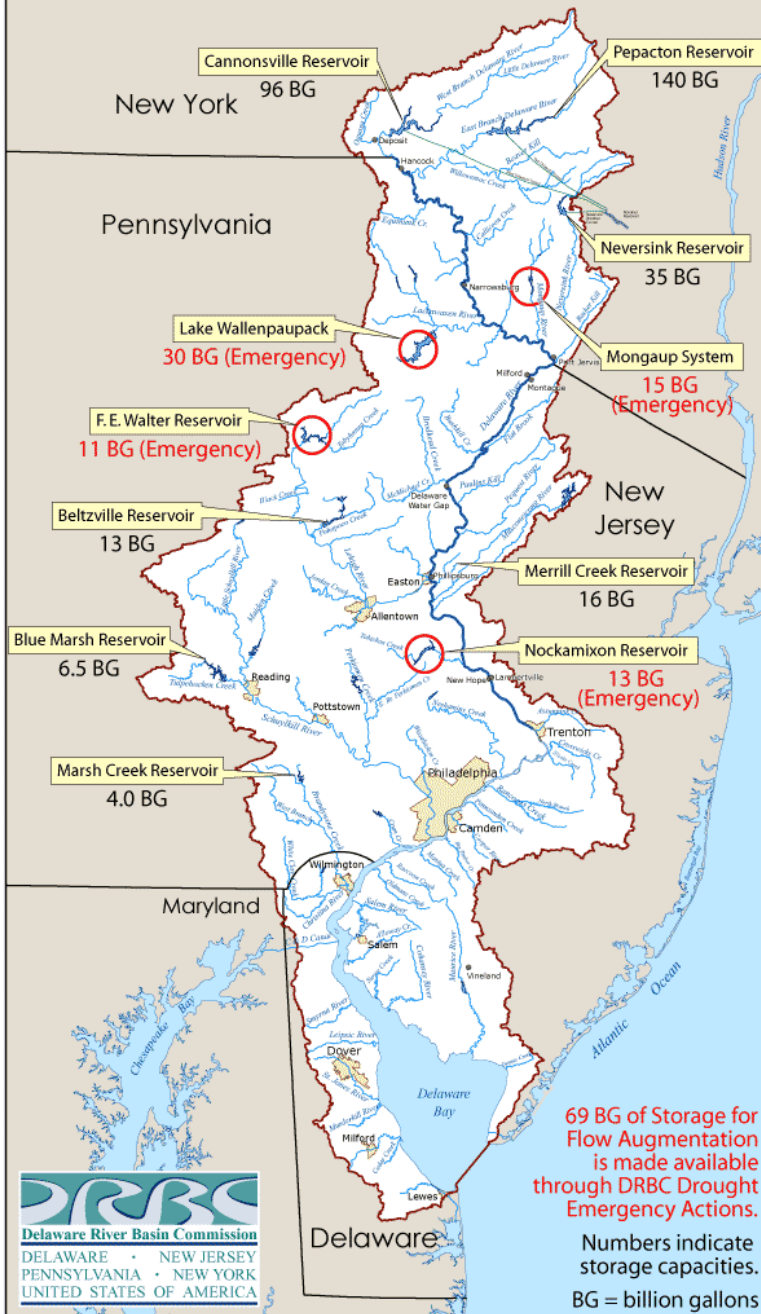
Under the commission's drought plan, freshwater releases from reservoirs help repel the upstream migration of salty water in the Delaware River. If the salt-laced water migrates too far upstream, it can threaten public water supplies and increase costs for industries. Under the DRBC's 2001 drought emergency declaration, F.E. Walter Reservoir, a U.S. Army Corps of Engineers (USACOE) flood control project located on the Lehigh River, was used to provide temporary water storage during the drought. The DRBC requested releases totaling about one billion gallons (bg) from the reservoir's temporary water storage during 2002 to bolster streamflows at Trenton and maintain estuary inflow.

The DRBC also directed releases from Blue Marsh Reservoir (located on a tributary of the Schuylkill River) totaling 614 million gallons for a short period during August and September 2002.

In addition to the available lower basin water storage in Beltsville (located on a tributary of the Lehigh River), F.E. Walter, and Blue Marsh reservoirs, releases were made from Merrill Creek Reservoir (located near Phillipsburg, N.J.) to augment flows at Trenton and replace evaporative losses caused by power generation. A consortium of electric utilities built this 16 billion-gallon storage reservoir in 1987 after the DRBC determined that supplemental water supply storage was needed if basin utilities were to continue to operate at full capacity during droughts. Otherwise, cutbacks might be necessary during water supply emergencies. Over 1.6 bg of water was released from this reservoir between October 2001 and January 2002 to make up for evaporative losses caused by power generation. The commission believes this program may be the only one of its kind in the nation.

In order to meet the upper basin Montague, N.J. minimum flow target while conserving water storage in the NYC Delaware reservoir system, releases totaling about half a billion gallons were directed from Lake Wallenpaupack by the DRBC in January 2002 under the drought emergency provisions of the DRBC Water Code. This reservoir is a power generation impoundment owned by PPL Generation, LLC and is located on a tributary of the Lackawaxen River near Hawley, Pa.

Reservoirs for Interstate Flow Management in the Delaware River Basin



Flood Loss Reduction Efforts Continue

On September 15, 2003, severe flooding associated with the remnants of Tropical Storm Henri occurred in the Red Clay Creek Watershed, which drains portions of Pennsylvania and Delaware. Chester County, Pa. near the Delaware state line was particularly hard hit. The Delaware Geological Survey reported that more than 10 inches of rain fell in a five-hour period, resulting in estimated damages to dwellings and structures exceeding \$43 million in New Castle County, Del. A similar precipitation event in June 2001 caused by Tropical Storm Allison resulted in damages totaling \$35 million over portions of Bucks and Montgomery counties in Pennsylvania. Such flood damages illustrate the continuing need for maintaining and improving flood warning systems as well as developing and implementing flood mitigation programs.

Flood Warning

A set of flood warning recommendations for the Delaware Basin originally developed in 2001 by commission staff with guidance from the DRBC's Flood Advisory Committee was updated in 2002. A July 2002 report to the commissioners from then-committee chair Clark D. Gilman, which included these updated recommendations, appears on the DRBC web site at http://www.nj.gov/drbc/Flood_Website/july02rpt.htm. DRBC staff members have been working with the National Weather Service (NWS) to pursue funding for the recommendations, which would provide the data and equipment needed to support development of the Advanced Hydrologic Prediction Services (AHPS) in the basin. The AHPS program provides near real-time graphical flood forecast products on the Internet for locations where flood forecast points have been established. Initial NWS AHPS products, which can be found via the DRBC web site, proved extremely useful during periods of high flood potential in 2003 and provided a means for local emergency officials and private citizens to keep track of flood stage forecasts.

Implementation of the DRBC flood warning recommendations is critical to further development of AHPS products in the basin. Federal funding of the AHPS program is separate from the funding required for the streamflow and precipitation gages and the topographical mapping included in the advisory committee's recommendations which also is needed to apply the full range of AHPS products.

The following progress related to the flood warning recommendations was made in 2002-2003 by member organizations of the Flood Advisory Committee:

Extensive flood-related information can be found on the DRBC web site at http://www.nj.gov/drbc/Flood_Website/floodinf.htm.

- In the New York City reservoir watersheds located in the Upper Delaware region, the city's Department of Environmental Protection and the NWS embarked on a program to install between 15 and 30 new precipitation gages as well as upgrade existing gages to be consistent with U.S. climate reference network standards. All gages would be equipped with radio telemetry for frequent reporting. The estimated project cost is \$500,000.
- In an effort to improve public education opportunities, the DRBC expanded its web site to include links to NWS flood forecast information and flood preparedness information provided by the Federal Emergency Management Agency (FEMA), Red Cross, and other organizations. DRBC staff members also participated in two local briefings related to flood warning products and flood mitigation programming. These were held in cooperation with the NWS, U.S. Geological Survey (USGS), and the Pennsylvania Emergency Management Agency, and took place in areas severely impacted by flooding from Tropical Storm Allison.
- The Delaware Geological Survey and the Office of the State Climatologist, in cooperation with the Delaware Emergency Management Agency, worked on procedures to support development of a severe weather warning system in northern New Castle County. Through a cooperative program with USGS, four stream gages in the Piedmont of northern New Castle County have been upgraded with automated data collection platforms that report stream stages at one hour intervals. These stations were equipped with phone lines allowing the gages to call specified numbers to report when critical stream stages have been reached. Real-time weather stations also have been installed in Newark and Wilmington, Del. and Longwood Gardens and Avondale, Pa. as part of the Delaware Environmental Observation System.

(continued on page 23)

Flood Loss Reduction Efforts Continue (continued from page 11)

Additional flood warning support outside the scope of the DRBC flood warning recommendations included:

- Installation of computerized Citizen Alert Networks by Bucks County (Pa.) and Merrill Creek Reservoir (N.J.). These systems are capable of simultaneously alerting via telephone hundreds of floodplain residents if flooding is expected in the Neshaminy Creek Watershed (Pa.) or in the communities surrounding the reservoir.
- Continued efforts by USGS, the U.S. Army Corps of Engineers, state environmental protection agencies, DRBC, and private organizations to fund the operation and maintenance of the Delaware Basin's stream gaging stations. River flood warning would not be possible without these gages, which serve multiple purposes and are often partially funded by local partners. You can learn more about the importance of stream gages on the DRBC web site at <http://www.nj.gov/drbc/gage/gageshp.htm>.



A view of the Delaware River Ice Jam from Morrisville, Pa. on February 20, 2003. This was a period of high flood potential due to the heavy snowpack and forecasted warmer temperatures and rain. Fortunately, flooding did not occur, but the development of new tools, such as AHPS, proved very useful in monitoring the situation. (Photo by Gail Blum)

Flood Mitigation

Flood mitigation includes all structural and non-structural measures which reduce the potential for flood damage. The maintenance of dams and levees, flood control reservoir operations, stormwater management, property acquisition and floodproofing, floodplain regulations, and flood mapping all contribute to flood mitigation.

Many organizations were actively involved in this important work during 2002-2003, including federal and state emergency management agencies, state environmental protection and community affairs agencies, U.S. Natural Resources Conservation Service, and academic-affiliated organizations (such as the Water Resources Agency of the University of Delaware and Temple University's Center for Sustainable Communities). Information on the specific activities of these organizations is available on their individual web sites.

The development of hazard mitigation plans required under the Disaster Mitigation Act of 2000 and the remapping of floodplains where development has impacted flood levels are important and growing components of flood mitigation work.

Flow Management Issues in the Delaware River Basin

An Interesting and Unique History

The Catskill Mountain region of the upper Delaware River Basin in New York State, which is approximately 100 miles from the New York City (NYC) metropolitan area, provides the city with more than half of its water. The water is stored and transported to NYC, which lies outside of the basin, through a system of city-owned reservoirs and aqueducts. The downstream states – Pennsylvania, New Jersey, and Delaware – also rely heavily on the waters of the Delaware. Throughout its entire length, the Delaware River provides valuable habitat and is an outstanding recreational resource. Trout Unlimited has estimated that river-related recreational activity in the upper Delaware resulting from the world-class, coldwater fisheries created by releases from three large NYC reservoirs generates some \$30 million per year for the local economy. These multiple demands have led to intense competition for the waters of the Delaware.

The U.S. Supreme Court issued a decree in 1931, which was amended in 1954, to resolve an interstate dispute over the allocation of water in the Delaware River Basin. The 1954 amended decree increased the allowable diversion by NYC to an average of up to 800 million gallons per day (mgd) from its three in-basin reservoirs (Cannonsville, Pepacton, and Neversink). However, this was conditioned on the city releasing enough water from these reservoirs to maintain a minimum flow rate of 1,750 cubic feet per second (cfs) in the Delaware River at Montague, N.J. This is commonly referred to as the “streamflow objective” at Montague. The 1954 amended decree also authorized New Jersey to divert an average of 100 mgd from the Delaware Basin to the Raritan River Basin through the Delaware and Raritan Canal. The nation’s highest court gave the responsibility of ensuring that the provisions of its 1954 decree are met to an official in the U.S. Geological Survey known as the Delaware River Master.

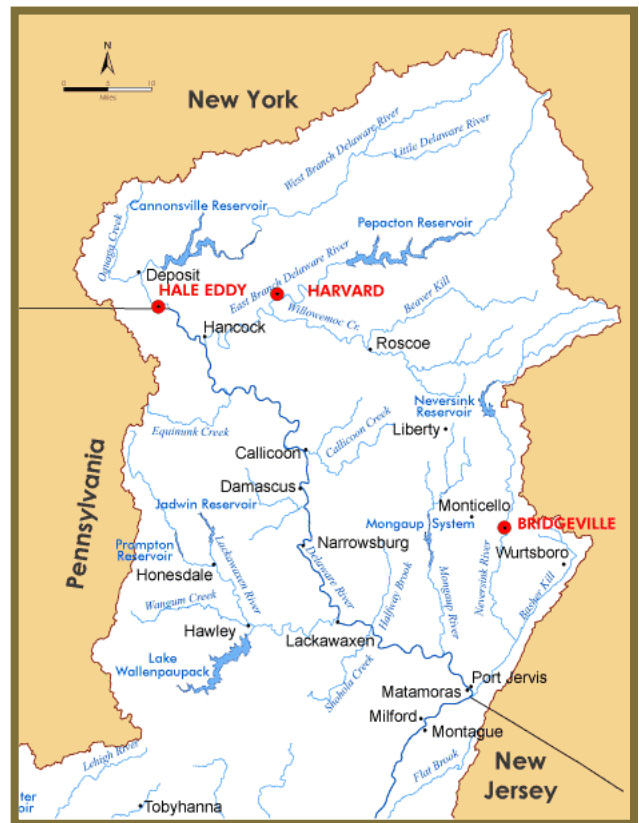
The DRBC, a federal-interstate compact agency, consists of the governors (or their alternates) from each of the four basin states and a federal representative. In contrast, the decree party representatives are the governors (or their alternates) from the four basin states and the mayor (or designated alternate) from NYC.

The compact creating the DRBC provided it with the unique authority to adjust the 1954 decree *conditioned on the unanimous consent of the decree parties*, and the commission has exercised this power on numerous occasions. The most significant of these adjustments resulted from the implementation of the “Good Faith Agreement” in the early 1980s that included the DRBC drought operating plans. These operating plans were prompted by a record drought in the 1960s and were made to conserve storage and ensure adequate minimum flows during a repetition of such conditions.

The Challenge

The three NYC reservoirs in the upper Delaware were built by the city for water supply. The U.S. Supreme Court’s 1954 decree required releases from the reservoirs to meet the Montague minimum flow objective, but did not require minimum releases to protect fisheries in tailwaters downstream of the dams.

Over the past 25 years, the New York State Department of Environmental Conservation (NYSDEC) has taken the lead in studying the fisheries and proposing release schedules to protect them, but the legal setting is quite complex. While the commission has the authority to adjust the operating rules of the decree, the DRBC cannot unilaterally dictate increased fishery releases to the city because there must be unanimous consent among all of the decree parties. As a result, the DRBC



This map of the upper Delaware River Basin highlights in red the location of the three proposed minimum flow targets for fishery protection.

serves the critical role of providing a forum for the decree parties to negotiate improved fishery releases.

Commission staff spent considerable time and effort throughout 2002 and 2003 to support the work of its advisory committees and stakeholders to re-examine flow allocation in the upper Delaware region, considering water supply, the down-basin states' needs, and the needs of fisheries in the upper basin.

Here are some of the major developments that took place during 2002 and 2003:

New Experimental Flow Target for Fisheries Protection on the West Branch

While continuing the ongoing process of negotiating a permanent fisheries release program more responsive to the water conditions downstream of the NYC Delaware Basin reservoirs, the commissioners in April 2002 approved a resolution establishing an experimental flow target of 225 cfs during normal conditions at Hale Eddy, N.Y. on the West Branch of the Delaware. This action, which was unanimously agreed to by the decree parties, was the first

time that a flow target was put into effect for fisheries protection in the tailwaters below the NYC reservoirs. The releases would come from a "habitat bank" of water set aside for this purpose, which consisted of about 3.8 billion gallons (bg). The resolution further stipulated that this flow target would be reduced during drought watch and warning operations, and be suspended during drought emergencies. The

commissioners at their March 2003 meeting, with NYC's concurrence, extended this temporary program through April 30, 2004 to allow for additional time to reach a longer term fisheries agreement.

The DRBC serves the critical role of providing a forum for the decree parties to negotiate improved fishery releases.

Proposed Three-Year Interim Fishery Management Plan

The commission's Flow Management Technical Advisory Committee and the decree parties spent much of 2003 reviewing a proposal by NYSDEC for a three-year interim fishery management plan that would extend from May 1, 2004 through May 31, 2007 while discussions continue toward development of a long-term flexible reservoir release program. Although the exact wording had still not been finalized by the end of 2003, the key point of the proposal included the establishment of minimum flow targets during normal conditions below all three NYC reservoirs: on the East Branch of the Delaware at Harvard, N.Y. and on the Neversink River at Bridgeville, N.Y., in addition to Hale Eddy on the West Branch. Reduced minimum flow targets would be in effect during drought watch, warning, and emergency operations. Another major element of the three-year plan would be an available bank of water totaling approximately 13.3 bg (20,000 cfs-days) from the NYC reservoirs to be used to maintain the three targets and control water temperatures so they are suitable for the coldwater fisheries. This interim plan would allow for more flexible use of water storage designed for fishery protection with priority given to thermal protection since the trout can be threatened when water temperatures are too high. The interim plan also includes provisions to allow thermal releases during drought operations, which was previously unavailable.

It is hoped that this proposal will be considered by the commissioners and the decree parties for approval in April 2004.

Revisions to Lake Wallenpaupack's Drought Operating Plan

A revised drought operating plan for Lake Wallenpaupack, owned and operated by PPL, complements the three-year interim fishery plan now under consideration by the commission and the decree parties. The plan would provide an additional 4 bg of water to be used at the commission's discretion during drought watch, warning, and emergency operations to meet the flow targets on the Delaware River. In return, PPL would receive a credit of up to 3 bg toward satisfaction of the DRBC's consumptive use replacement requirements (the commission requires power

generating stations during droughts to make up for the tremendous amounts of water they use that evaporates, or face cutbacks to their power operations). Modeling has shown that the implementation of the PPL plan allows for the increased fishery protection releases under the proposed interim fishery plan while lowering the frequency of conditions triggering the various drought operations that are based on combined NYC reservoir storage.

This proposed revision will not go into effect unless the proposed three-year interim fishery management plan also is adopted by the commission and the decree parties.

OASIS Flow Model

All of the computer flow modeling associated with the NYSDEC fishery proposal development and the PPL drought operating plan revision was conducted by multiple parties using a new daily flow model with the trade name OASIS, developed as part of a recent flow management study paid for by the DRBC at a cost of \$400,000. A report on that study, which identifies flow-related issues of the basin's regulated streams and suggests approaches to provide better information to resolve the issues, is in the last stages of review by the decree parties.

In-Stream Flow Needs

The commissioners in September 2003 unanimously approved a resolution recognizing and supporting the use of a formal process for developing and evaluating the feasibility of achieving flow targets to address instream flow and freshwater inflow requirements for aquatic ecosystems in the Delaware River Basin. The commission and the decree parties committed to participating in this non-binding collaborative process to develop experimental flow management options for the Delaware River and its regulated tributaries. Furthermore, the resolution recognized a new subcommittee of the commission's Flow Management Technical Advisory Committee — known as the *Subcommittee on Ecological Flows (SEF)* — to incorporate its expertise in aquatic ecology to develop the ecological basis for in-stream flow requirements throughout the basin. This subcommittee, which met in October and December, is chaired by Colin Apse of the Nature Conservancy.



Cannonsville Reservoir on the West Branch of the Delaware. (Photo by Rick Fromuth)

Dwarf Wedgemussel

Most recently, DRBC staff, agency partners, and stakeholders have been assessing the significance of the Endangered Species Act on upper Delaware flow management initiatives in light of the presence of the dwarf wedgemussel, a federally listed endangered species. The question to be answered is, "What flow criterion is needed to protect the species?" Flow management policy would then be considered to meet this criterion.

For more information about flow management and other hydrologic issues, please visit the DRBC web site at <http://www.nj.gov/drbc/hydro.htm>.

PCBs in the Delaware Estuary

Stage One TMDLs Established in 2003

A milestone in water pollution control was achieved on December 15, 2003, when the U.S. Environmental Protection Agency (EPA) established total maximum daily loads (TMDLs) for polychlorinated biphenyls (PCBs) in the Delaware River Estuary based on several years of technical work conducted by the DRBC. This action was taken on behalf of the states of New Jersey, Pennsylvania, and Delaware and is part of an ongoing program designed to protect human health from the effects of eating PCB-contaminated fish now found in the estuary.

The three states and EPA asked the DRBC in the spring of 2000 to take the lead in developing the technical basis for the TMDLs, an extraordinarily complex task that has relied on scientific investigations, data collection efforts, and water quality modeling.

“The Delaware River is the cleanest it’s been in decades,” DRBC Executive Director Carol R. Collier noted. “But the presence of PCBs remains a problem. States bordering the river have issued fish consumption advisories because of elevated PCB levels in fish tissue. The goal is to reduce the level of this toxic

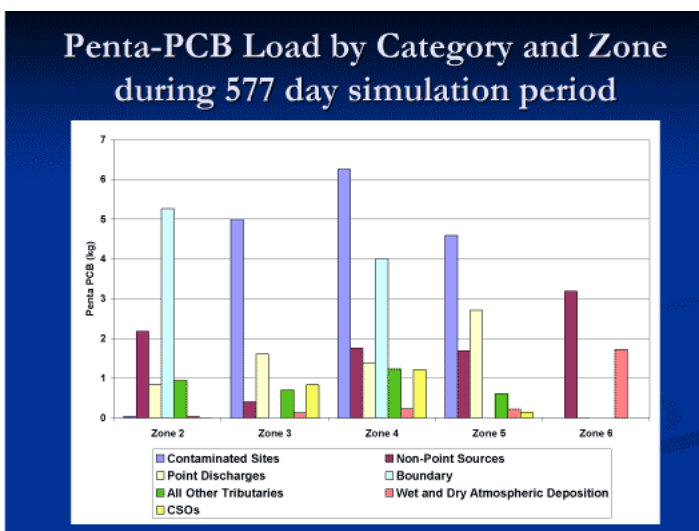
substance to a point where the standards are met and the advisories are no longer necessary.”

What are PCBs and TMDLs?

The EPA has classified PCBs as a probable human carcinogen. The United States banned the manufacture and general use (with a few exceptions) of PCBs in the late 1970s, but not before 1.5 billion pounds of the substance was produced. PCBs were used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don’t burn easily and are good insulators. The chemical stability of PCBs, which encouraged their use in hundreds of industrial and commercial applications, also allows them to persist in the environment. PCBs enter fish and other wildlife through absorption or ingestion, and accumulate in their tissues at levels many times higher than in the surrounding water and at levels unsuitable for human consumption.

There are numerous sources of PCBs in the Delaware Estuary. They include contaminated sites, non-point sources like stormwater runoff, industrial and municipal point source (“end-of-pipe”) discharges, the mainstem Delaware River above Trenton, N.J., tributaries to the Delaware both above and below Trenton, the atmosphere, combined sewer overflows (CSOs), and the Atlantic Ocean.

A TMDL is essentially a “pollution budget.” It sets the maximum amount of a specific pollutant that a water body can receive without violating applicable water quality standards. It then allocates that amount among all sources in the watershed – both point and non-point – which must then reduce loads to the allocated levels in order to achieve and maintain the standards.



“Boundary” in zone 2 refers to the Delaware River above Trenton, N.J. and in zone 4 refers to the Schuylkill River above the Fairmount Dam. “All other tributaries” excludes the Schuylkill River.

The four TMDLs established in December 2003 address different water quality zones (Zones 2-5) in the 85-mile tidal reach of the Delaware River from Trenton downstream to the head of the Delaware Bay, near Liston Point, Del. The TMDLs also include tidal portions of tributaries.

Each TMDL must provide for the achievement of the applicable water quality standard within the zone and also must ensure that water quality in downstream zones is adequately protected. The TMDLs will be incorporated by Pennsylvania, New

Jersey, and Delaware into their current water quality management plans.

A staged approach to establishing the PCB TMDLs, first discussed in Spring 2002, is being used. DRBC staff developed and calibrated a water quality model for one particular type of PCB (known as “Penta-PCBs”) that represents about one-quarter of the total PCBs present in the estuary.

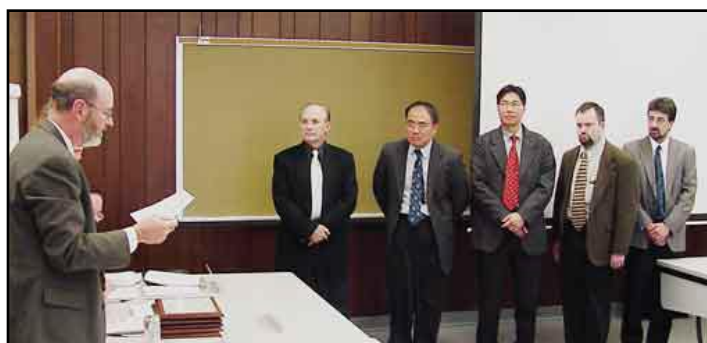
“The successful development of the water quality model was a collaborative effort of the DRBC staff and scientists from Limno-Tech, Inc., a consultant to the commission, and HydroQual, Inc., a consultant to a coalition of industrial and municipal point source dischargers,” noted Dr. Thomas Fikslin who headed the DRBC’s technical effort. The model, in turn, was extrapolated for total PCBs in order to develop the Stage One TMDLs in 2003. The December 2003 deadline had been established under a court-mandated schedule resulting from a lawsuit against the federal government. DRBC, EPA, and the estuary states will continue to further refine the TMDLs through more detailed monitoring to enhance the Stage One model. The Stage Two TMDLs are scheduled to be established in December 2006.

The principle sources of PCB loadings are contaminated sites and non-point sources.

An Interstate-Federal Collaborative Effort

DRBC staff worked closely with the commission’s Toxics Advisory Committee (TAC), comprised of representatives from the states, EPA, municipal and industrial dischargers, academia, agriculture, public health, environmental organizations, and fish and wildlife interests. Assisting commission staff and the TAC was an expert panel of scientists from EPA, Rutgers University, Tufts University, University of Maryland, Mississippi State University, and Interface Inc. “Achieving the December 2003 deadline was only possible through collaborative projects with several academic institutions – such as the University of Delaware, Rutgers University, and the Chesapeake Biological Laboratory – and our state partners, particularly the Delaware Department of Natural Resources & Environmental Control,” Fikslin said.

“The reduction in PCB levels will not occur overnight and achieving the water quality standards will take decades,” Collier said. “Point source dischargers will be required to develop and implement PCB minimization plans, and non-point pollution reduction strategies will need to be crafted. Fortunately, some large dischargers along the river already are conducting studies to track



DRBC Chairman Ernest Hahn (representing N.J. Governor McGreevey) reads a certificate of appreciation for outstanding service that was presented to five commission staff members in December 2003. The technical PCB TMDL team honorees included (from left to right) Modeling and Monitoring Branch Head Tom Fikslin, Daniel Liao, Namsoo Suk, John Yagecic, and Gregory Cavallo. (Photo by Clarke Rupert)

down PCBs on a voluntary basis.”

“Developing the scientific basis and actually reducing the levels of PCBs is an extremely complex undertaking, and I am pleased to report that the overall efforts by the DRBC and its governmental partners to open up the process for greater participation by all interested stakeholders has been well-received,” Collier added.

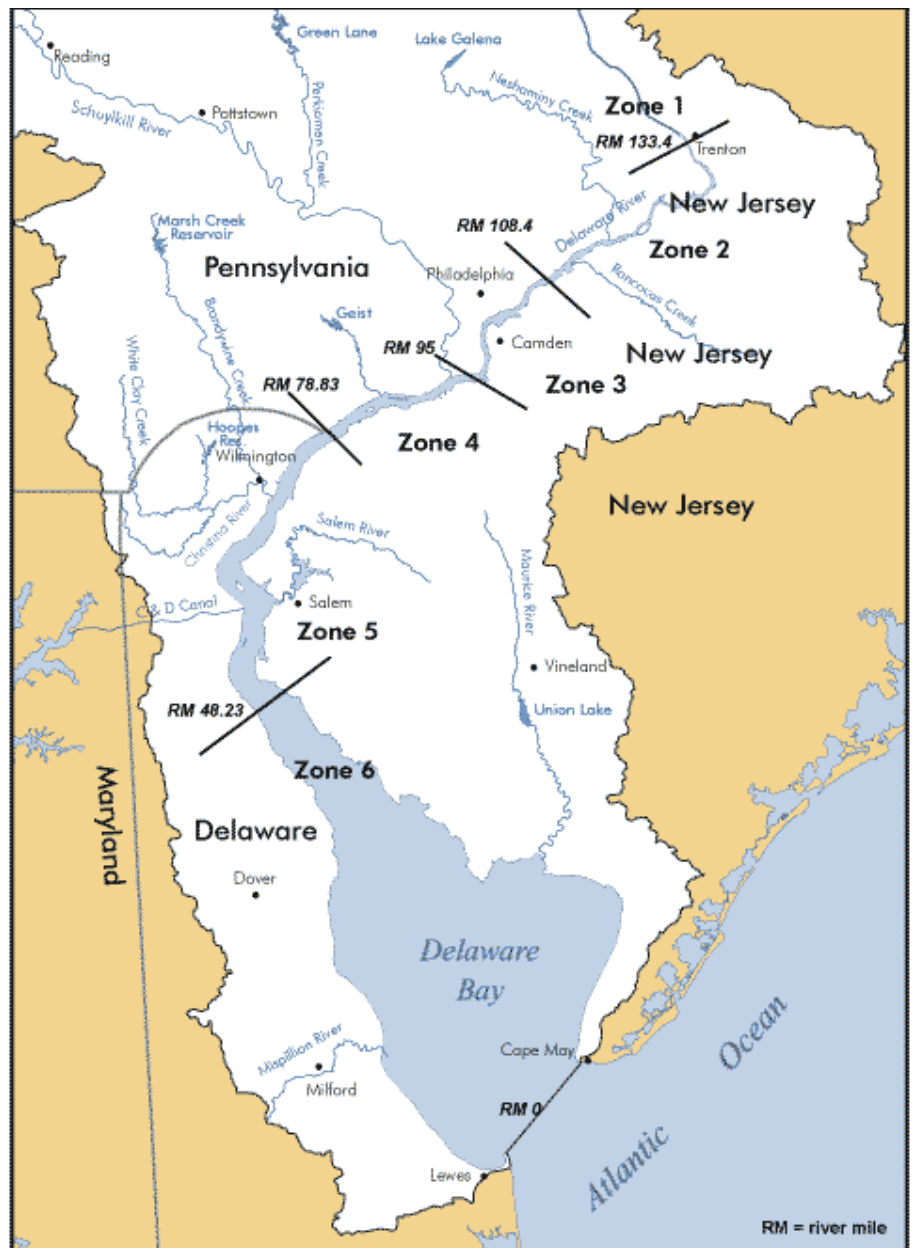
The commission’s TAC has formed the core of stakeholder involvement in the process. The DRBC established a new TMDL Implementation Advisory Committee (IAC) in 2003, which has been asked to develop creative and cost-effective strategies for reducing loadings of PCBs. Members include the three estuary states, municipal and industrial dischargers, and fishery, wildlife, and environmental organizations.

Other stakeholder participation opportunities in 2002 and 2003 included:

- A Science Symposium held in October 2002 that was sponsored by the Delaware Estuary TMDL Coalition (which includes municipal and industrial dischargers);
- A meeting among regulators and stakeholders held in April 2003 that focused on the TMDLs and their regulatory implications;
- Three informational meetings held during September 2003 in Delaware, New Jersey, and Pennsylvania about the proposed TMDLs; and
- An October 2003 public hearing held in Philadelphia on the proposed TMDLs.

To learn more about this important water quality initiative, please visit the DRBC web site at http://www.nj.gov/drbc/toxics_info.htm.

Delaware Estuary Water Quality Zones



Basin Plan Development Moves Ahead

A Common Vision for a Common Resource

“Good plans shape good decisions. That’s why good planning helps to make elusive dreams come true.”
– Lester R. Bittel, American author.

As directed by the “Resolution on the Protection of the Delaware River Basin” signed by the four basin state governors in September 1999, the DRBC continued to move ahead with the challenge of developing a water resources plan for the basin (basin plan) during 2002 and 2003.

The basin plan will be a 30-year, goal-based framework that will serve as a guide for all stakeholders – government and non-governmental alike – whose actions affect water resources in the basin.

A Watershed Advisory Council, whose members represent a broad spectrum of basin interests ranging from business and industry to environmental advocacy groups, has been working closely with DRBC staff, the commission’s standing advisory committees, and ad hoc committees in the facilitated, consensus-building process to forge a unifying vision for the basin. Council members have participated in nine meetings and three workshops since January 2001, and five draft plans evolved during 2002-2003.

Important elements of the goal-based plan to guide policy and action include:

- Maintaining and improving the quantity and quality of the basin’s water supply;
- Reducing flood losses, improving recreational experiences, and restoring the basin’s essential riparian and aquatic ecosystems;
- Improving the integration of the basin’s water resources with land use and development;
- Strengthening partnerships among all levels of government, the private sector and individuals, and enhancing the commitment to the protection, improvement, appreciation and restoration of the basin’s water resources; and
- Providing new opportunities for learning how to protect and restore our river basin.

The plan is prefaced by a set of twelve guiding principles against which all policy decisions and actions affecting water resource management should be measured. It also suggests a set of goals and objectives with milestones and indicators to measure progress towards achieving the plan’s desired results. The basin plan emphasizes integration and collaboration, and is not prescriptive or regulatory.

The commissioners in October 2003 directed DRBC staff to solicit public comment on the *Draft Water Resources Plan for the Delaware River Basin* as a means of broadening awareness of the plan beyond the valued group of stakeholders who have participated in its development over the past three years. A series of meetings will be held in all four basin states in early 2004. It is hoped that this outreach also will help to develop management strategies to implement the plan and identify potential implementation partners. Comments received through the public process will be incorporated into the plan as appropriate, and the revised plan will be submitted to the council members and the states for their review.

Support for enhancing public participation and regional cooperation in the development of the basin plan was generously provided by a grant from the William Penn Foundation.

After the final basin plan is officially adopted in 2004, the next step for the DRBC will be to carefully examine its current comprehensive plan (CP) in light of the broader, direction-setting basin plan. The CP is now basically a loosely organized collection of DRBC policies, rules, and projects. It is driven by the Delaware River Basin Compact and provides the commission with the basis for setting standards and promulgating regulations. The CP will be restructured to include forward-looking components of the basin plan so that the new CP becomes a true planning document rather than simply a compilation of the DRBC’s past decisions.

The commission’s looming financial crisis resulting from the loss of federal funding to support its annual budget may impact its ability to move ahead with the implementation of some of the areas in the basin plan to be led by the DRBC. Fiscal year 2005 funding from the commission was intended to support prioritized actions to be accomplished through contracts with federal partners, but if the DRBC cannot pay the local match, these cost-sharing opportunities with the U.S. Geological Survey, U.S. Army Corps of Engineers, and the U.S. Environmental Protection Agency will be lost.

To learn more about the development of the basin plan, please visit the DRBC web site at <http://www.nj.gov/drbc/basinplan.htm>.

Integrated Resource Plan Guidelines Issued in 2002

An Important Component of the SE PA Groundwater Protected Area Program

The commission in April 2002 issued guidelines for the preparation of Integrated Resource Plans (IRPs) by municipalities under the DRBC's Southeastern Pennsylvania Ground Water Protected Area (GWPA) regulations.

Numerical ground water withdrawal limits were established by the DRBC in 1998 and 1999 for each of the 76 subbasins that fall either entirely or partially within the Protected Area. The goal is to prevent depletion of ground water and protect the interests and rights of lawful users of the same water source, as well as balance and reconcile alternative and conflicting uses of limited water resources in the region.

However, the GWPA regulations provide that the commission may revise a withdrawal limit to provide *additional protection* for a subbasin in accordance with more stringent requirements contained in an IRP adopted and implemented by all municipalities in the subbasin and incorporated into each municipality's comprehensive plan.

No subbasin withdrawal limits have yet been lowered by the DRBC under the IRP provision in the GWPA regulations, but the commission continues to have IRP-related discussions with a number of interested municipalities located in Bucks, Chester, and Montgomery counties. The Montgomery County Planning Commission worked on the development of a prototype IRP for the Swamp-Scioto Creeks Subbasin in 2002-2003, with funding assistance from the DRBC and Pennsylvania.

The issuance of the IRP guidelines in 2002 was the culmination of a process that began in 1998 when the commission created the Water Management Advisory Committee and asked it to identify guidelines by which municipalities could develop IRPs.

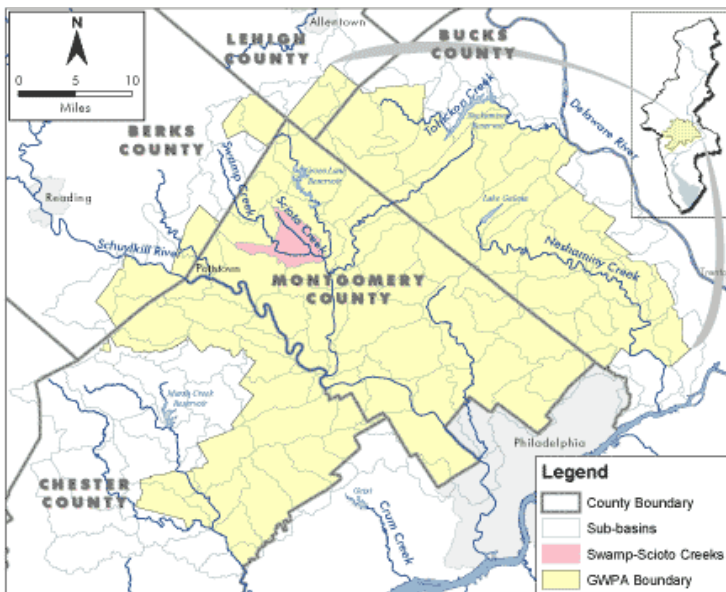
The guidelines, as well as additional GWPA information, can be found on the DRBC web site at <http://www.nj.gov/drbc/gwpapage.htm>.

Integrated resource planning is a comprehensive approach to water resource management that evaluates water resources availability and demands on a watershed level. The process encourages planning to meet multiple objectives and evaluate competing uses of water resources.

The DRBC, because of its unique structure and powers, is sometimes called upon to carry out programs that would be difficult, if not impossible, for the basin states or the federal government to accomplish on their own. An example is the management of the GWPA.

The Protected Area was established by the commission in 1980 at the request of Pennsylvania, which lacked the regulatory authority to carry out the program. The move was made after it became evident that development was negatively impacting ground water levels in the area.

SE PA Groundwater Protected Area



Homeland Security: Protecting our Drinking Water

Delaware Valley Early Warning Partnership Includes the DRBC

The Delaware and Schuylkill rivers provide drinking water for over three million people in the Philadelphia, Pa. - Camden, N.J. metropolitan area. Potential threats to these water supplies include a wide variety of accidental and intentional chemical, biological, and radiological releases that could result from industrial, maritime shipping, or waste treatment accidents and terrorist attacks. Terrorism could take the form of direct introduction of contaminants, or a more likely scenario of an attack on industrial infrastructure resulting in a release.

The DRBC and its partners are working on three tools to protect against accidental and intentional threats to these important drinking water sources: an Early Warning System (EWS), an advanced flow and transport model, and a real-time prototype detector network.

Early Warning System (EWS)

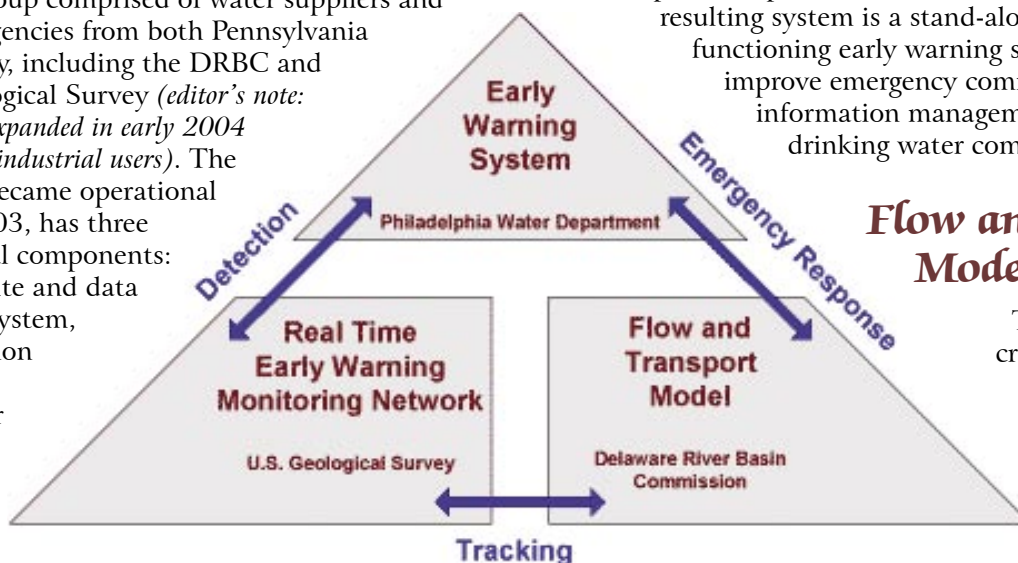
The Philadelphia Water Department (PWD) developed the Delaware Valley EWS with a \$725,000 grant awarded by the Pennsylvania Department of Environmental Protection in the aftermath of September 11, 2001. It was crafted with the cooperation and support of the EWS Partnership, which is a stakeholder group comprised of water suppliers and government agencies from both Pennsylvania and New Jersey, including the DRBC and the U.S. Geological Survey (*editor's note: this group was expanded in early 2004 to include select industrial users*). The EWS, which became operational in October 2003, has three major technical components: a secure web-site and data management system, a communication system, and a real-time water quality monitoring network.

“A comprehensive contaminant transport model administered by DRBC working in conjunction with the Delaware Valley EWS and real-time water quality monitoring will provide unparalleled regional coordination, communication and response to water quality contamination events in the Delaware River Basin.”

– Philadelphia Water Department

The overriding goal of the grant and the resulting project was to protect the drinking water supply infrastructure, which was identified as being among the nation's high priority resources vulnerable to a potential terrorist attack. In addition to serving this purpose, the EWS offers advance warning of accidental source water contamination events resulting from spills, transportation accidents, fires and other similar incidents. The EWS also provides water suppliers with source water quality information valuable in the daily operation of a water treatment plant.

PWD had one year to design and build the Delaware Valley EWS, and in that time focused on developing a system that would provide a framework to be expanded upon and enhanced in the future. The resulting system is a stand-alone and fully functioning early warning system that will improve emergency communication and information management among the drinking water community.



Flow and Transport Model

The second critical tool under consideration is an advanced flow and transport model. The DRBC and its

Delaware River Drinking Water Source Protection

The Delaware River Basin Commission, the City of Philadelphia, and the U.S. Geological Survey are working in concert to implement source water protection in the tidal Delaware River and tributaries.

partners recognize that fast and accurate simulations showing the movement of contaminants in tidal waters are a critical component of emergency response efforts in the Delaware Valley. The Delaware River is unusual because it has over 50 miles of tidal fresh water that supports numerous water intakes for Philadelphia and other Delaware Valley communities. When a contaminant is released to the tidal Delaware River below Trenton, N.J., the amount of time that contaminant remains in the water and the number of intakes it impacts are ultimately determined by the tidal fluctuation and flows from tributaries, including the non-tidal Delaware River above Trenton. Tidal movement of water in the Delaware exceeds 12 miles in many locations. A contaminant released at a given location can easily impact both upstream and downstream intakes. During a contaminant release event, water utility managers need to know which public water intakes will be impacted and for how long in order to determine how to use limited water reserves most efficiently.

By refining and linking tools developed for other purposes, the DRBC is in a unique position to develop a highly accurate real time model for contaminant transport. This capability is enhanced by the DRBC's unique position in the basin, including its ability to work across political boundaries, a wealth of water management data and understanding, and existing relationships with water utility managers.

development of real time detectors of chemical, biological, and radiological agents in drinking water sources as well as in water distribution systems. Through this ongoing effort, USGS will develop the monitoring infrastructure needed to support prototype detectors, test and compare new detectors as they become available, and provide water supply managers with real-time data.

Next Steps

Although PWD will continue to operate the current Early Warning System, the EWS Partnership is seeking U.S. Department of Homeland Security grant funds through New Jersey and Pennsylvania for important enhancements that will make EWS even more powerful and effective. These funds would allow the system to encompass a wider geographic area, improve its database, web server, and communication systems, develop an enhanced flow and transport model to be undertaken by the DRBC, and enhance real-time monitoring capability. The projected total cost for these improvements is about \$1.1 million, which includes operating costs for seven real-time monitoring platforms during the first year. Additional funds of \$945,000 would be required to continue the real-time monitoring operations for three more years. Efforts to develop dedicated funding sources for real-time monitoring from public and private entities and to expand the EWS Partnership would then be undertaken over the next four years.

“The Commission’s role in ensuring a safe and plentiful water supply, including coordination of emergency preparedness plans among the federal government and the four basin states, is of growing importance today, given the number of natural and manmade threats that can impact this regional water resource.”

**– Ruth Ann Minner
Delaware Governor**

Real Time Early Warning Monitoring Network

Finally, DRBC is working with the U.S. Geological Survey (USGS) to secure additional funding to support

Christina River Basin

Clean Water Partnership Receives \$1 Million EPA Watershed Initiative Grant

Several noteworthy events took place during 2002-2003 as a result of continuing efforts by the Christina Basin Clean Water Partnership, of which the DRBC is a member, to preserve and protect this interstate subbasin of the Delaware River Watershed that drains portions of Pennsylvania, Delaware, and Maryland.

On November 18, 2002, approximately 100 persons attended the partnership's "Clean Water is Good Business" program which was held in Kennett Square, Pa. The keynote speakers were Congressmen Joseph R. Pitts (R - Pa.) and Michael N. Castle (R - Del.), who together

represent most of the residents of the 565-square-mile interstate watershed in the U.S. House of Representatives. In addition to offering brief remarks, the two members of Congress shared copies of a joint letter they signed in strong support of a \$1 million grant application submitted by the Commonwealth of Pennsylvania and the State of Delaware to the U.S. Environmental Protection Agency's (EPA) Watershed Initiative Grant program.

Following welcoming remarks by DRBC Commissioners Irene Brooks (Pa.) and Kevin Donnelly (Del.), a "State of the Watershed" presentation was provided by Jan Bowers (Chester County Water Resources Authority [WRA]) and Gerald Kauffman (University of Delaware WRA). The program also featured a panel discussion moderated by DRBC Executive Director Carol R. Collier.

Less than six months later, EPA announced in May 2003 that the partnership had been selected to receive the requested \$1 million grant to restore and protect this interstate subbasin. The funds will be used to implement agricultural and stormwater Best Management Practices in targeted areas as well as SMARTYARD homeowner landscape projects. The partnership was one of only 20 community-based groups (out of 176 applications) receiving funding under the \$15 million national program and its application received the highest ranking of all those submitted.

Because of its unique ability to manage watersheds without regard to state borders, the DRBC's role in promoting interstate coordination and cooperation has been an important factor in the ongoing success of this clean water partnership.

The basin includes the Christina River (which eventually flows into the Delaware River in Wilmington, Del.), Brandywine Creek, White Clay Creek (which was added to the National Wild and Scenic Rivers System in 2000), and Red Clay Creek. It provides water to over 500,000 people, including 75% of the water supply for New Castle County, Del. and more than 40% of the water supply for residents in Chester County, Pa.

To learn more about this ongoing interstate project, please visit the DRBC's web site at <http://www.nj.gov/drbc/christinabasin.htm>.



U.S. Rep. Joseph Pitts (left), DRBC Commissioner Irene Brooks, and U.S. Rep. Michael Castle listen to a question from the audience at the "Clean Water is Good Business" program. (Photo by Clarke Rupert)



EPA Regional Administrator Donald S. Welsh formally presented the \$1 million Watershed Initiative grant to the Christina Basin Clean Water Partnership at the Ashland Nature Center in Hockessin, Del. on November 7, 2003. DRBC Executive Director Carol R. Collier accepted the ceremonial check on behalf of the partnership. (Photo by Jonathan Zangwill)

Special Protection Waters

Efforts to Revise DRBC Regulations Underway

DRBC staff members, with guidance from the commission's Water Quality Advisory Committee, devoted considerable time and energy during 2002 and 2003 preparing draft revisions to the DRBC's water quality regulations, and in particular to its Special Protection Waters (SPW) regulations.

The commission's SPW regulations were adopted in the early 1990s to protect the Delaware River's existing high-quality waters in the reach between the Delaware Water Gap and Hancock, N.Y. These regulations focus on controlling both point ("end-of-pipe") and non-point source discharges, such as stormwater runoff.

One of the main mechanisms to control non-point source pollution is the requirement that projects located in the SPW drainage area that are subject to DRBC review must submit for approval a Non-Point Source Pollution Control Plan (NPSPCP). The NPSPCP describes the Best Management Practices that will be used at the project site and within the project's service area to control the increases in non-point source pollutant loadings resulting from the project.

Since many projects fall below the DRBC review threshold and the NPSPCPs are adopted on a case-by-case basis, the commission is currently revising its SPW regulations to increase the effectiveness of the non-point source component. While the DRBC will continue to require applicants to develop a site-specific NPSPCP, the proposed regulations would encourage the development of Area-Wide Plans on a municipal, multi-municipal, county, or watershed basis that contain a strategy for managing, controlling, and abating non-point source loadings within the geographic area of these plans. Through the development of Area-Wide Plans with a non-point source component, a greater portion of the SPW drainage area will be implementing non-point source controls that will protect the high water quality found in this stretch of the Delaware River.

The DRBC also is revising its SPW regulations by adding design principles and minimum requirements for the NPSPCP to control the rate, volume, and quality of stormwater generated by new development. Concurrently, the commission is writing a guidance manual to assist applicants in complying with the SPW regulations. The proposed revisions, when finished, will be the subject of an administrative rulemaking process before the commissioners vote on their final adoption.

By revising the SPW regulations to encourage the development of Area-Wide Plans and adding minimum requirements for NPSPCPs to control stormwater, the DRBC is taking action to more effectively control non-point source pollutant loadings in the SPW drainage area, thereby helping the commission meet its goal of maintaining existing high water quality in this section of the basin.

SPW Designation In Other Parts Of The Basin

The SPW regulations currently affect only the 120-mile stretch of the Delaware River from the Delaware Water Gap upstream to Hancock, but they could be applied to other basin waterways that meet certain criteria. The DRBC will consider nomination petitions from local, state and federal agencies as well as the public calling for SPW designation in



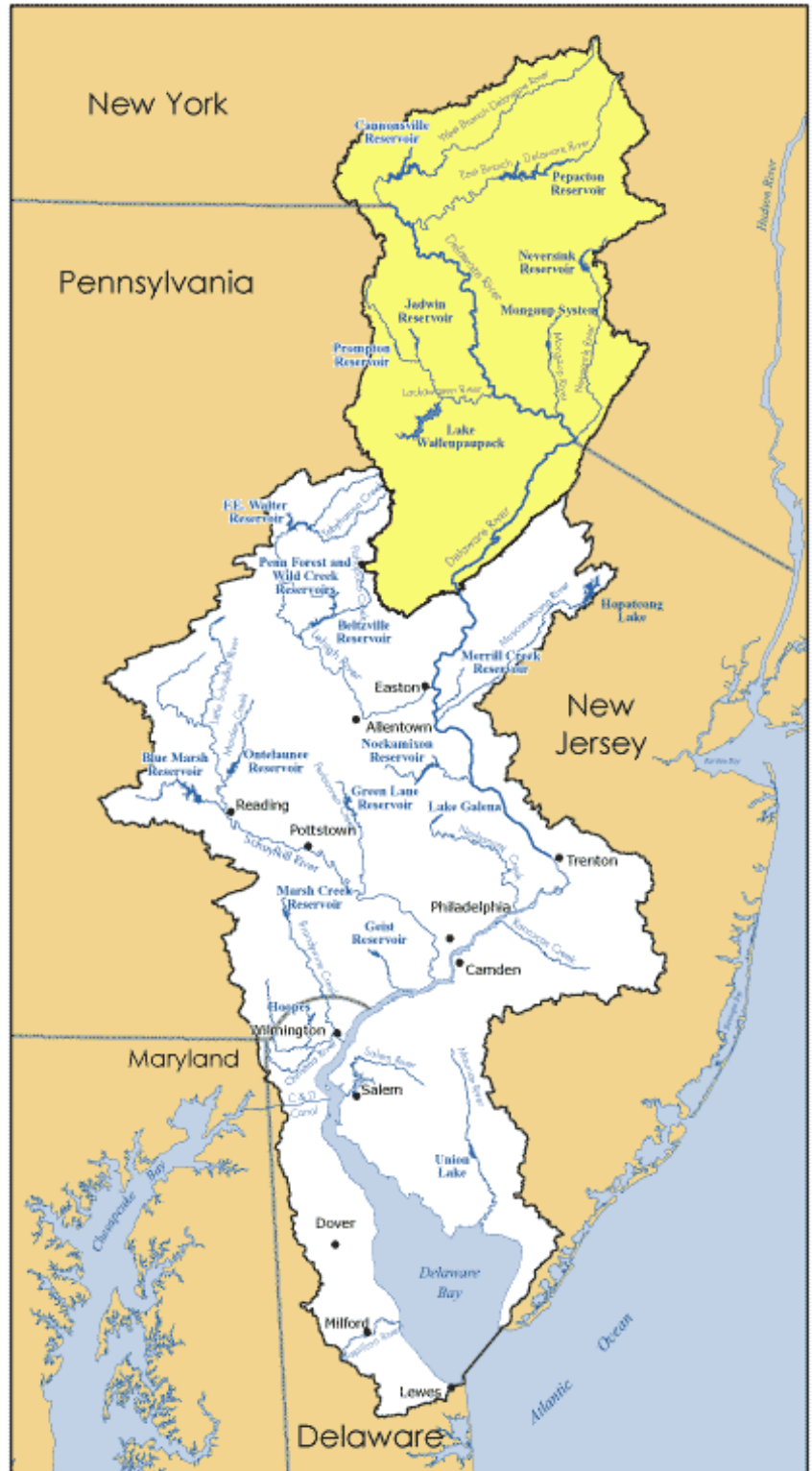
Bald eagles are attracted to the high-quality waters of the Delaware because fish is their preferred food source. This January 2002 photo that captured the eagles on the Delaware was taken by David B. Soete in Narrowsburg, N.Y.

other parts of the basin. Petitions are considered on a case-by-case basis and may result in further studies. Commission action to add waters to the SPW program will be taken only after a formal comment period and public hearing.

The Delaware Riverkeeper Network petitioned the commission in 2001 to designate the Lower Delaware River from the Delaware Water Gap National Recreation Area downstream to the head of tide at Trenton as Special Protection Waters. This area is now under evaluation by the DRBC for possible SPW designation. The commission is currently collecting water quality data in the Lower Delaware River to define existing water quality, but additional data are still needed. Congress and the President added portions of the Lower Delaware River to the National Wild and Scenic Rivers System in 2000.

Additional information about the Special Protection Waters regulations can be found on the DRBC web site at <http://www.nj.gov/drbc/spw.htm>.

Special Protection Waters Drainage Area



The commission's SPW regulations were adopted in the early 1990s to protect the Delaware River's existing high-quality waters in the reach between the Delaware Water Gap and Hancock, NY.

Delaware River Sojourn

The Delaware: Pennsylvania's 2002 Feature River of the Year

The Delaware River Sojourn, an annual event to heighten awareness of and appreciation for the historical, recreational, and environmental significance of the Delaware River through public events, educational programs and by paddling its inviting waters, celebrated its eighth and ninth years in 2002 and 2003.

"On behalf of all Pennsylvanians, I offer my best wishes for continued partnerships in our work to restore, maintain, and enhance the Delaware's scenic beauty, water quality and quantity. I hope you have an enjoyable and successful river journey on a truly Revolutionary River!"

— Greetings to sojourners from
Governor Mark Schweiker, 2002.

Pennsylvania Department of Conservation and Natural Resources (DCNR) as the commonwealth's "Feature River of the Year" in January 2002. The feature river's sojourn is traditionally the first one to take place in June, which is American Rivers Month. The theme of the 2002 sojourn was "The Delaware: A Revolutionary River." A commemorative poster honoring the river and the sojourn's theme was created by DCNR, with the help of DRBC staff, and can be found on the front cover of this 2002-2003 report.

A special kick-off reception took place on May 31 at Grey Towers National Historic Landmark in Milford, Pa., the home of Gifford Pinchot. Pinchot, one of America's leading advocates of environmental conservation at the turn of the twentieth century, was

a former governor of Pennsylvania who also served in the administration of President Theodore Roosevelt.

The 2002 sojourn began the next day at Pond Eddy, N.Y. and eight days later finished at the John Heinz National Wildlife Refuge in Philadelphia. In between these points, participants not only paddled over 70 miles, but they heard from George Washington (portrayed by Robert Gerenser) before the general and several of the sojourners crossed the Delaware at the famous spot that became the turning point in the Revolutionary War. The sojourn is normally a "rain or shine" event, but a rain-swollen Brandywine Creek kept sojourners out of their canoes and kayaks for the very first time on June 7 due to safety concerns.

Sojourners also had the opportunity in 2002 to attend a special reception at the New Jersey State Museum in Trenton to honor its exhibit, "River of Leisure," which traced the Delaware's recreational uses. The DRBC provided assistance to the museum in the development of this exhibit.

The DRBC's public information office created a special 2002 sojourn scrapbook

The 2002 sojourn, which took place June 1 through June 8, was held earlier than usual for a very special reason: the Delaware was named by the



Sojourners arriving at Washington Crossing as seen from the New Jersey side of the river on day five of the 2002 event. (Photo by Chris Roberts)

to honor Pennsylvania's "river of the year," which can be viewed along with photo albums and other sojourn-related information at <http://www.nj.gov/drbc/sojourn.htm>.

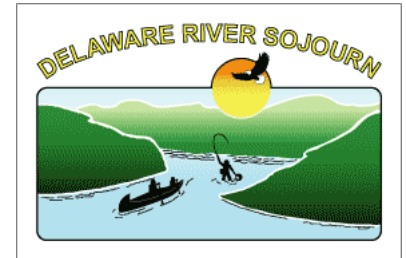
The theme for the 2003 sojourn, held from June 14-21, was "The Delaware: More Than a River." Sojourners faced above-normal river flows as well as cloudy or rainy weather for much of the week, but this was a common occurrence in the basin throughout the entire year. The event started in Callicoon, N.Y. and included about 80 miles of paddling over the next seven days. Sojourners spent the last day on the Philadelphia/Camden section of the river aboard the *North Wind*, a 75-foot schooner that is operated by Philadelphia City Sail, Inc., a nonprofit educational organization with a focus on economically disadvantaged youth in the Delaware Valley region. Earlier in the week, the sojourners participated in an "Open Space Celebration Luncheon" at the site of an old quarry located next to the Delaware River and Delaware Canal State Park in Bucks County, Pa. There they heard about the state park's plans to provide public access points to the river as well as more outdoor recreation and natural-history classroom/research opportunities on this property, which will be protected as open space.

The sojourn is planned each year by a steering committee that was chaired in 2002 by DRBC Executive Director Carol R. Collier and in 2003 by Suzanne Forbes with the Delaware River Greenway Partnership (DRGP). The committee members who served during one or both of the 2002-2003 sojourns represented the following partners, in addition to the DRBC and DRGP: Academy of Natural Sciences, American Canoe Association, Bucks County Open Space Partnership, Bucks County River Country, Central Bucks West High School Environmental Club, Delaware and Raritan Greenway, Delaware Canal State Park, Gnarly River Women Paddling Club, Kittatinny Canoes, Inc., National Canoe Safety Patrol, National Park Service (Delaware Water Gap National Recreation Area, Upper Delaware Scenic and Recreational River, and Delaware and Lehigh National Heritage Corridor), N.J.

Department of Environmental Protection (DEP), Palmyra Cove Nature Park, Partnership for the Delaware Estuary, Inc., Pa. DCNR; Pa. DEP, Pa. Environmental Council, Pa. Organization for Watersheds and Rivers (POWR), Pocono Environmental Education Center, Pocono Mountains Vacation Bureau, Inc., Princeton Hydro, LLC, and Upper Delaware Council, Inc. The steering committee is a proud affiliate member of the American Canoe Association.

Sponsors over the two years included the Rohm and Haas Company, SUNOCO, William Penn Foundation, DRBC, Philadelphia Wooden Boat Factory, PPL Services Corporation, Exelon, Princeton Hydro, Aventis-Pasteur, Water Resources Association of the Delaware River Basin, Reliant Energy, Lehigh Valley Canoe Club, Mirant Corporation, Delaware Family Campground, Driftstone on the Delaware Campground, Gnarly River Women Paddling Club, and the Jersey Paddler. A special thanks goes to Pa. DCNR and POWR for their valuable support.

Additional information about the 2002 and 2003 sojourns can be found on the DRBC's web site.



"Your [DRBC's] participation in this project last year significantly contributed to its success, and so I wanted to share this good news with you."

– July 25, 2003 letter from The New Jersey State Museum's Curator of Cultural History James F. Turk to DRBC Executive Director Carol R. Collier announcing that the museum was awarded a Certificate of Commendation from the American Association for State and Local History for its exhibition, *River of Leisure: Recreation Along the Delaware River and Bay*.

According to Dr. Turk, this awards program is the nation's most prestigious competition in local, state, and regional history.

The DRBC: A Classroom for the World

The fact that five separate governmental bodies with their own sovereign powers can successfully work together on an equal footing in managing a common resource has caught the eye of other river managers not only in this country, but around the world.

The DRBC welcomed delegations from South Korea, the People's Republic of China, Uganda, and Sri Lanka to its West Trenton headquarters in 2002 and 2003. Deputy Executive Director Bob Tudor also made a presentation to a delegation from Costa Rica at Villanova University in November 2003.

The visitors were interested in learning about the commission's organizational structure as well as its programs and activities in areas such as water pollution control, water conservation, watershed planning, flood control, water supply/drought operations, project review, and public outreach.

The delegations often included high-ranking officials, including the Sri Lankan minister of water management who also serves as a member of his nation's parliament. The Ugandan officials were searching for ideas to help them manage the world's second largest freshwater lake – Lake Victoria – which also borders two other nations and feeds the Nile, the world's longest river. The 20-person Chinese delegation that visited the commission in December 2003

“International exchanges and training provide our nation with a unique opportunity to advance America’s foreign policy objectives and, at the same time, to make a difference in the lives of people around the world ... The purpose of the IAWG is to ensure that we are all in harmony, directing our effort toward the common goal of mutual respect and understanding between the people of the United States and the people of the world. At their core, exchange and training programs are means to that end – ensuring that all that is good and noble about America is shared with the people of the world.”

– IAWG FY 2003 Annual Report



Visitors from the People's Republic of China join DRBC Public Information Officer Chris Roberts for a view of the Delaware River at Washington Crossing on Dec. 6, 2002. (Photo by Clarke Rupert)

included the lead engineer who designed the Three Gorges Dam on the Yangtze River, described as China's biggest construction project since the Great Wall.

The Interagency Working Group on U.S. Government-Sponsored International Exchanges and Training (IAWG), created by executive order and public law, is comprised of members from over 25 federal departments and agencies. It produces an annual compilation of federally sponsored international visitor programs as a way to help facilitate information sharing among federal managers. The DRBC was included for the first time in the IAWG's federal fiscal year (FY) 2002 Inventory of Programs as well as its FY 2003 Annual Report and Directory of International Visitor Programs.

DRBC News Briefs from Around the Basin

World Water Monitoring Day

Over 100 local school children and their teachers learned from and interacted with staff from the DRBC, the U.S. Geological Survey (USGS), and the New Jersey Department of Environmental Protection (NJDEP) as these agencies demonstrated different water quality monitoring techniques in October 2003, as part of the World Water Monitoring Day celebration. The event took place at historic Washington Crossing State Park in Titusville, N.J. along the Delaware River and the Delaware and Raritan Canal. The students from Lambertville and West Amwell elementary schools who were on hand to observe and take part in measuring the quality of the water were accompanied by several freshman biology students from South Hunterdon Regional High School. The attendees were welcomed on the sunny, brisk autumn day by NJDEP Assistant Commissioner Ernest Hahn, NJDEP Water Monitoring & Standards Administrator Leslie McGeorge, USGS New Jersey District Chief Rick Kropp, DRBC Executive Director Carol R. Collier, and Washington Crossing State Park Superintendent Dave Donnelly.

World Water Monitoring Day was coordinated by America's Clean Water Foundation and the International Water Association to engage the public in global efforts to protect and enhance worldwide water quality. From September 18 to October 18, people around the globe joined together to monitor the quality of their local watersheds and enter the results of their efforts into an international database. Monitoring activities took place across the United States and in countries such as Australia, Brazil, Canada, France, Gabon, Indonesia, Israel, Japan, New Zealand, Philippines, Poland, South Korea, Taiwan, and the United Kingdom.

You can learn more about this event by visiting the DRBC's education web site, "Ed. Web," at <http://www.drbc-edweb.net>.

"Wild and Scenic" Delaware Celebrates 25th Anniversary in 2003

November 2003 marked the 25th anniversary of the federal law designating the Upper Delaware and Delaware Water Gap reaches of the river as components of the National Wild and Scenic Rivers System. The DRBC was happy to join many of the partners comprising the Upper Delaware community in celebrating the milestone at an event hosted by the National Park Service (NPS) in Lackawaxen, Pa. on Sunday, November 9.

These two river corridors take in approximately 145,000 acres. However, while nearly 70,000 acres along the 40-mile river stretch comprising the Delaware Water Gap National Recreation Area is owned by the federal government, only 30 acres along the 73-mile Upper Delaware Scenic and Recreational River is federal land. As was pointed out at the anniversary celebration, the legislation signed into law by President Jimmy Carter on November 10, 1978 was specifically written to provide a unique approach to accomplishing the goals of scenic river designation while preserving local authority in the Upper Delaware Corridor.

Additional stretches of the Delaware and its tributaries were added to the national system in 1993 and 2000. To learn more, please visit the DRBC web site at http://www.nj.gov/drbc/wild_scenic.htm.

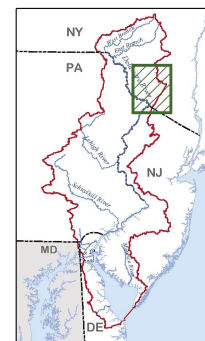
Tri-State Watershed Management Plan: An Interstate "Keep the Clean Water Clean" Initiative

Carrying out its mission to provide comprehensive watershed management, the DRBC is working with other partners to develop a management plan in the tri-state region around Port Jervis, N.Y. that can accommodate anticipated growth while maintaining the existing high water quality.

The 300-square-mile project area drains to an 8.5 mile reach of the main stem Delaware River that borders New Jersey, New York, and Pennsylvania. This river segment, which has been designated by the commission as Special Protection Waters, is just north of the Delaware Water Gap National Recreation Area and extends upstream to the southern edge of the Upper Delaware National Scenic and Recreational River.

Focus group interviews to seek input from water users, landowners, recreationists, business and industry representatives, conservation and other advocacy groups, and local, state, and federal

Tri-State Watershed Location in the Delaware River Basin



officials, took place over two days in September 2003. These interviews were conducted by the DRBC, NPS, and the Lincoln Institute of Land Policy, which is a nonprofit educational institution that strives to better understand and promote regional approaches to land use. Interested stakeholders attended an October 2003 follow-up clinic on regional collaboration facilitated by the Lincoln Institute in Milford, Pa.

Former DRBC Commissioner Warren Lavery briefly returned for about five months in 2003 as the Tri-State Watershed manager to take the lead in conducting the fall kickoff meetings. He has since retired and the DRBC and NPS are exploring ways to continue this important project at a reduced level.

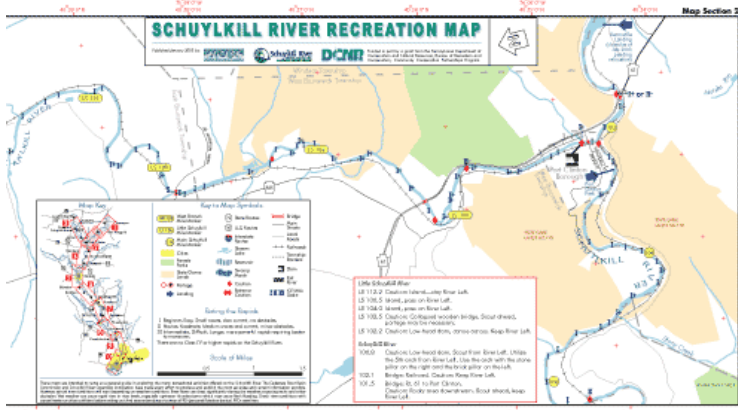
In addition to the DRBC and NPS, other project partners include The Nature Conservancy, U.S. Environmental Protection Agency (EPA), the three states' environmental agencies, counties and municipalities, industry, developers, watershed associations, academia, and concerned citizens.

Additional information about this project will be posted on the DRBC web site at <http://www.nj.gov/drbc/tristate.htm> as it becomes available.

New Maps Released in 2003 Depict Recreational Opportunities in the Delaware River Basin

Two new mapping projects were completed in the first half of 2003. "I-Map DelBasin" is an Internet tool that identifies sites to launch boats, gaging stations that provide river flows, locations where recreational boaters can safely pump out marine heads, state and federal parks, and state and federal fish consumption advisories.

I-Map DelBasin was developed by the DRBC's Information Management Advisory Committee consisting of geographic information system (GIS) experts from the four basin states, U.S. EPA, the U.S. Geological Survey (USGS), and Lehigh University, along with commission staff. The developers took dissimilar digital reference maps from the four states and customized them into one standardized map with a uniform scale. Specialized GIS software is not needed to run the application and it works best with the Internet Explorer web browser (version 5.0 and above).



Portion of Map Section 2 of the Schuylkill River recreation maps. Actual map size is 24" wide, 9" high.

Tri-State Watershed



I-Map can be found on the DRBC's map gallery at <http://www.nj.gov/drbc/gallery.htm>. The DRBC provided \$40,000 in funding for the project, while the Delaware Estuary Program and the Commonwealth of Pennsylvania each contributed \$5,000.

Updated recreation maps of the Schuylkill River prepared by the DRBC in partnership with the Schuylkill River Greenway Association and the Pennsylvania Department of Conservation and Natural Resources also were released in 2003. The ten-map set covers the river from its headwaters

near Tamaqua, Pa., to its confluence with the Delaware River at Philadelphia, some 125 miles downstream. Portions of the Little Schuylkill River and the Schuylkill's West Branch also are mapped. The full color, waterproof maps depict public access areas along the river, as well as the location of riffles and rapids (white water), dams, bridges, forests, parks, and major highways. In addition, sections of the river are classified as to their degree of difficulty based on ratings by the International Canoe Federation/American Whitewater Affiliation, field investigations, and published works about the Schuylkill.

The cost of the updated map set is \$15. Ordering instructions can be found on the DRBC web site (<http://www.nj.gov/drbc/schuylkillmaps.htm>), or you can contact the commission in writing at P.O. Box 7360 West Trenton, NJ 08628, or by phone (609-883-9500).

DRBC Revises Its Permit Review Fee Schedule in 2003 for the First Time Since 1991

In response to increasing costs and declining revenues, the commission at its June 2003 meeting approved a plan to update its project review fees for the first time in twelve years. The fees were first instituted in 1972 in order to allocate to applicants a portion of the cost of reviewing water resource projects and are paid at the time applications are filed.

The new schedule includes for the first time a minimum fee of \$250 for public projects sponsored by political subdivisions of the basin states and increases the private project minimum fee from \$250 to \$500, with a sliding scale based upon project cost for larger projects. There are new fees for emergency certificates to waive or amend a docket condition as well as for docket transfers upon a change of ownership. In addition, the surcharge for any project resulting in an out-of-basin diversion was increased. In all cases, if the fixed or calculated fee is deemed by the executive director to be insufficient due to actual costs associated with DRBC review, the commission may now charge the applicant 100 percent of all costs deemed to be exceptional. The revised fee schedule became effective on July 1, 2003 for all applications submitted on or after that date.

The complete fee schedule as well as assorted project review applications can be found on the DRBC web site at <http://www.nj.gov/drbc/pjrev.htm>.

New Delaware Estuary Grants Program in 2003

The Delaware Estuary Grants Program, a new initiative established in 2003 by the National Fish and Wildlife Foundation (NFWF) in partnership with the Delaware Estuary Program (DELEP), provided 27 grants totaling \$500,000 for projects in Delaware, New Jersey, and Pennsylvania to improve water quality and living resources in the estuary. Activities supported by the grants, which were announced in September 2003, included wetland and stream restoration, riparian plantings, and land conservation, as well as the development and implementation of community watershed management plans and other water quality improvement strategies.

Funding for the first year of this program was provided by the U. S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture's Natural Resources Conservation Service, the William Penn Foundation, and ConocoPhillips.

NFWF is a private, nonprofit organization established by Congress in 1984 that is dedicated to the conservation of fish, wildlife, plants, and the habitat on which they depend. DELEP is a partnership organized in 1988 to develop and implement plans for the protection and enhancement of the Delaware Estuary. With offices at the DRBC's West Trenton headquarters, it is organized and funded primarily by U.S. EPA, the states of Delaware and New Jersey, the Commonwealth of Pennsylvania, the Partnership for the Delaware Estuary, DRBC, and the City of Philadelphia in collaboration with many other agencies and organizations that share an interest in maintaining the estuary's ecosystem and the associated economic and recreational opportunities.

A listing of the grant recipients, along with a brief description of the projects, can be found on NFWF's web site at <http://www.nfwf.org/programs/delaware2003.htm>.



View of the Delaware Bay from Cape Henlopen State Park in Lewes, Del. This is the mouth of the bay where it meets the Atlantic Ocean. (Photo by Clarke Rupert)

Delaware River and Bay Water Quality Assessment 2002 Report

At the request of the basin states, the DRBC prepares a biennial report on the main stem interstate Delaware River and Bay required by section 305(b) of the federal Clean Water Act of 1972. The commission's "305(b) report" is a summary of an evaluation of the river's ability to support certain water uses, such as maintaining aquatic life, swimming, supplying water for human consumption and industrial uses, and supporting fish and shellfish that are safe for human consumption.

The assessment primarily involves comparing levels of key water quality indicators (pH, for example) with DRBC stream quality objectives listed in its water quality regulations.

According to the 2002 report, which covers 2000 and 2001, full support of the aquatic life, drinking water, and recreation uses was generally noted where sufficient data existed to make assessments. In some portions of the non-tidal river, high pH and dissolved solids arose as issues that may need to be addressed. In the estuary, low dissolved oxygen in some locations indicated partial support for aquatic life, and the drinking water use was considered not supported based only on in-stream water quality objectives. This latter assessment, however, did not address the quality of *finished* (i.e., treated and ready for distribution) drinking water, which is considered to be safe. Fish consumption was the use that was most widely not fully supported since consumption advisories were present along the entire length of the Delaware River.

The foundation for the assessment came from DRBC's three water quality monitoring programs that cover different sections of the Delaware River. These include the Scenic Rivers Monitoring Program (from Hancock, N.Y. to the Delaware Water Gap), the Lower Delaware Monitoring Program (from the Delaware Water Gap to Trenton, N.J.), and the Delaware Estuary Boat Run Program (from Trenton, N.J. to the mouth of the Delaware Bay).

In addition, data from a variety of other sources were utilized in making the water quality assessments. These other sources include the USGS, the Pennsylvania Department of Environmental Protection (DEP) Stream and Wastewater Treatment Plant Water Quality Monitoring Program, the Delaware Department of Natural Resources and Environmental Control Surface Water Quality Monitoring Program, and the New Jersey DEP Ambient Surface Water Monitoring Program.

The biennial reporting of water quality assessments of the Delaware River is intended to provide U.S. EPA and the public with an overview of water quality conditions by identifying broad issues. More intensive studies and analyses are needed for focusing in on site-specific issues. The 305(b) report can serve as a basis for further study.

The complete 2002 report can be viewed on the DRBC web site at <http://www.nj.gov/drbc/public.htm>.

2002 National Water Resources Conference Held in the Basin

The American Water Resources Association (AWRA) held its national conference in Philadelphia during the first week of November 2002. Jan Bowers of the Chester County

Water Resources Authority, a member of the DRBC's Water Management Advisory Committee and Watershed Advisory Council, chaired the conference's organizing committee. Commission staff members served on a number of panels, acted as moderators, and made presentations. During the conference, DRBC Commissioner Irene B. Brooks was awarded the Mary H. Marsh Medal for her outstanding watershed and water resource management efforts.

National Water Monitoring Day Commemorates Federal Law's Anniversary in 2002

Representatives from the DRBC, USGS, and New Jersey DEP participated in a series of water monitoring demonstrations on "National Water Monitoring Day," October 18, 2002, to commemorate the 30th anniversary of the federal Clean Water Act. The event, organized by the USGS, took place along both the Delaware River and the Delaware and Raritan Canal in Ewing Township, N.J. Guests included DRBC Executive Director Carol R. Collier, New Jersey DEP Chief of Staff Gary Sondermeyer, and USGS New Jersey District Chief Rick Kropp. The DRBC received a certificate of appreciation for its efforts from the 2002 Year of Clean Water Committee, which organized the national event. Additional information, including a photo album, can be found on the commission's "Ed. Web" at <http://www.drbc-edweb.net>.

DRBC Updates FOIA Fee Schedule in 2002

The commissioners in May 2002 amended the DRBC's *Rules of Practice and Procedure* to update the fees associated with Freedom of Information Act (FOIA) requests for the first time since 1975. The fees were in need of updating since they did not reflect current methods of recording and reproducing information or today's administrative costs. The most significant change was in the amount charged for labor associated with responding to FOIA requests. In developing the revised fee structure, DRBC staff reviewed the fees of the four basin state environmental agencies and the U.S. EPA, and recommended fees that fell in the middle of this group that closely matched those charged by the State of Delaware. The updated FOIA fee schedule can be found on the DRBC's web site at http://www.nj.gov/drbc/notice_FOIAfees.htm.

Shad and Bald Eagle Bookmarks a Big Hit!

In an effort to educate the public about the water quality improvements that have taken place throughout the Delaware River Basin since the 1960s when the commission was created, the DRBC produced two attractive and very popular bookmarks in 2002 and 2003. Cut out in the shapes of an American shad and bald eagle, these bookmarks remind children and adults alike that the basin has seen an increase in the number of these species thanks to efforts by the DRBC as well as other agencies and organizations to improve and protect water quality. Additional shad and bald eagle facts can be found on the commission's "Ed. Web" at <http://www.drbc-edweb.net>.



Visitors to Ed. Web also can view information and download flyers on topics such as *Baseball's Dirty Side*, *The Fairmount Water Works: A Place "Wondrous to Behold,"* *An Island Built With Peas*, and *Birds and Crabs*.

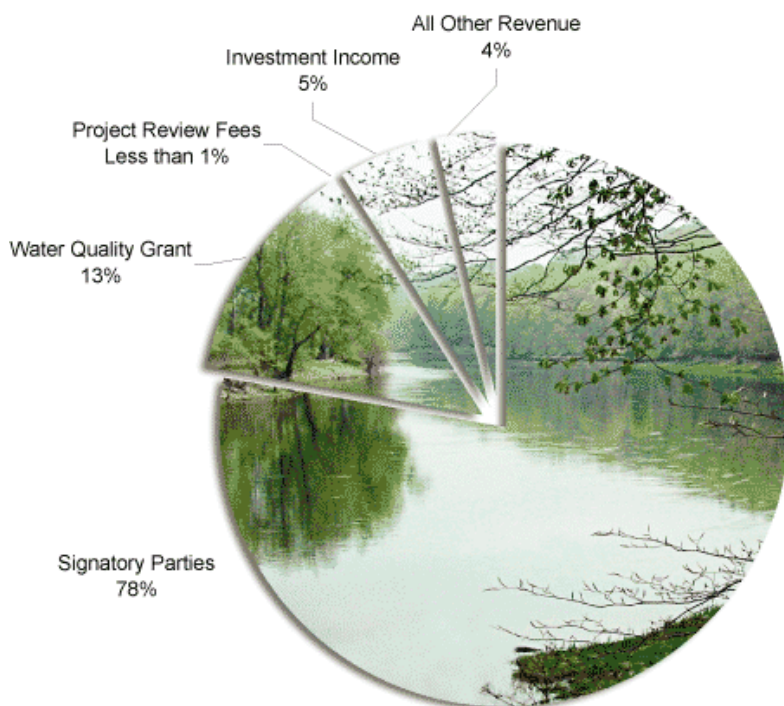


Financial Summary

Cumulative Federal Shortfall Continues to Grow

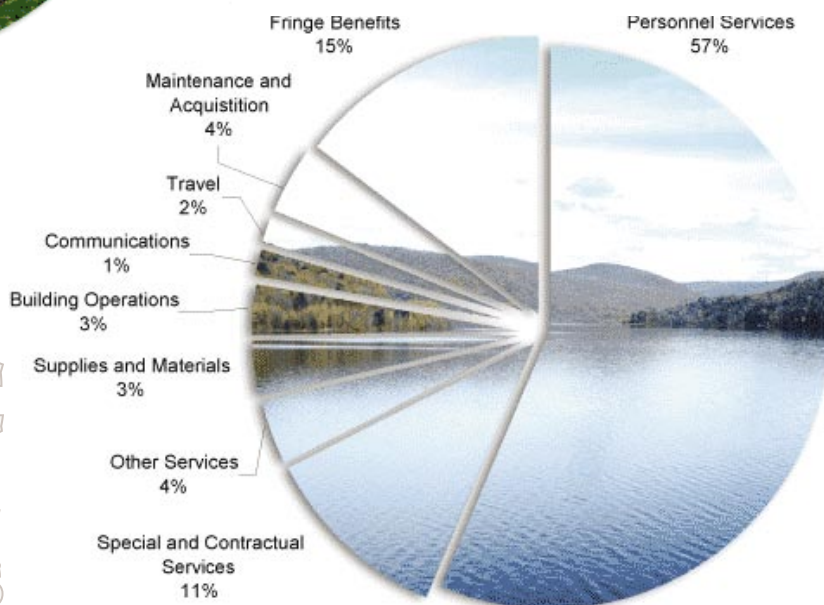
The Energy and Water Development Appropriations Act (P.L. 104-206) eliminated federal funding support of the DRBC's annual operating budget for federal fiscal year (FY) 1997 (October 1, 1996 through September 30, 1997). Federal funding has not resumed since that time and the resulting cumulative federal shortfall will have grown to over five million dollars by the end of DRBC FY 2004 (July 1, 2003 through June 30, 2004). Efforts are continuing to restore full funding by the signatories.

The 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.



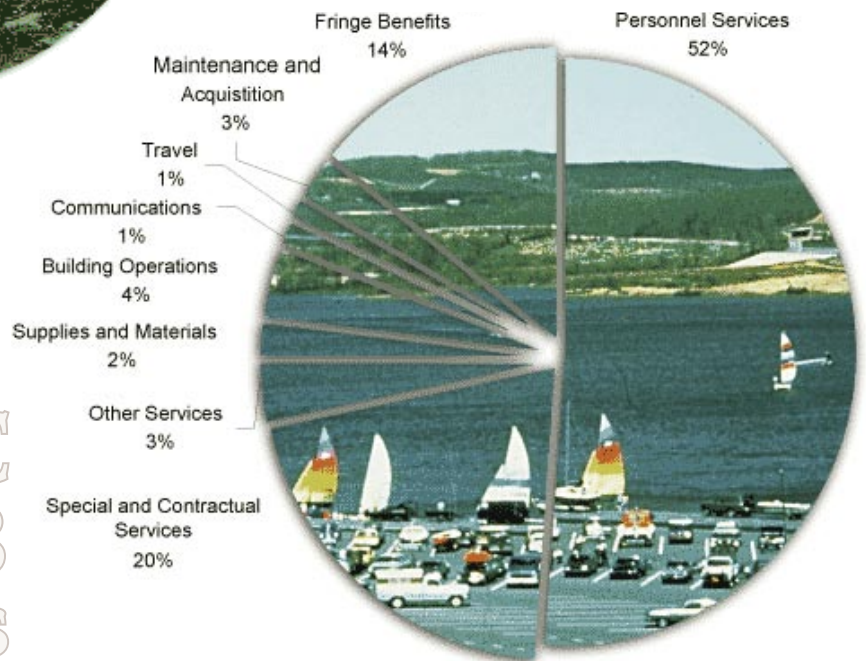
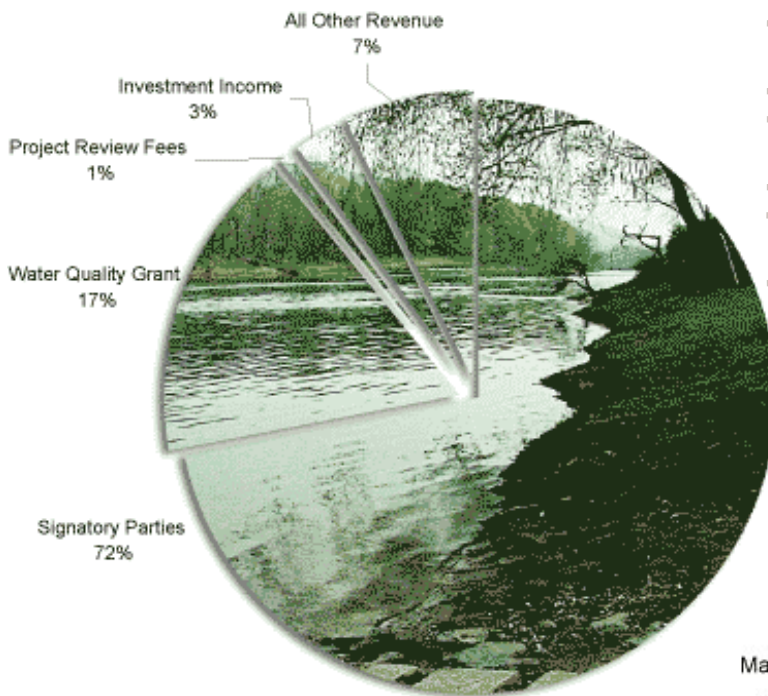
DRBC FY02 Revenues

DRBC FY02 Expenses



The commissioners directed DRBC staff in the fall of 2003 to develop a services reduction plan to address revenue shortfalls.

DRBC FY03 Revenues



DRBC FY03 Expenses

Delaware River Basin



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