Delaware River Basin Commission

2004

2005

The Delaware River Basin Commission (DRBC) is an interstate/federal agency created in 1961 by compact legislation signed into law by President John F. Kennedy and the governors of the four basin states with land draining to the Delaware River. The passage of this compact marked the first time 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.

The Delaware is the longest un-dammed river east of the Mississippi, extending 330 miles from the confluence of its East and West branches at Hancock, N.Y. to the mouth of the Delaware Bay where it meets the Atlantic Ocean. The river is fed by 216 tributaries, the largest being the Schuylkill and Lehigh Rivers in Pennsylvania. In all, the basin contains 13,539 square miles, draining parts of Pennsylvania, New Jersey, New York, and Delaware. Included in the total area number is the 782 square-mile Delaware Bay, which lies roughly half in New Jersey and half in Delaware. Nearly 15 million people (approximately five percent of the nation's population) rely on the waters of the Delaware River Basin for drinking and industrial use, but the watershed drains only four-tenths of one percent of the total continental U.S. land area. The 15 million figure includes about seven million people in the New York City area and northern New Jersey who live outside the basin. New York City gets roughly half its water from three large reservoirs located on tributaries to the Delaware.

This publication covers calendar years 2004 and 2005, and was produced by the DRBC's Communications Office, with the valuable assistance of numerous commission staff. It is available on the commission's web site at www.drbc.net. Copies are available upon request by contacting the DRBC (P.O. Box 7360, West Trenton, NJ 08628; 609-883-9500).

About the cover: This photo shows Delaware Governor Ruth Ann Minner addressing elected and environmental leaders along with other interested watershed stakeholders at an event held in Wilmington on Sept. 13, 2004 to celebrate the completion of the Water Resources Plan for the Delaware River Basin ("Basin Plan"). Also pictured (from left to right) are Joe DiBello (National Park Service), Donald S. Welsh (U.S. EPA, Region III), Jane M. Kenny (U.S. EPA, Region II), Brigadier General Merdith W.B. Temple, (DRBC Federal Representative), New Jersey DEP Commissioner Bradley M. Campbell (Governor McGreevey's alternate on the DRBC), Pennsylvania Lieutenant Governor Catherine Baker Knoll (representing Governor Rendell), and New York State DEC Division of Water Assistant Director Fred R. Nuffer (Governor Pataki's alternate on the DRBC and commission chair). Additional information about the Basin Plan can be found on page eight of this report. (Photo courtesy of the U.S. Army Corps of Engineers)

Delaware River Basin Commission
DELAWARE · NEW JERSEY
PENNSYLVANIA · NEW YORK
UNITED STATES OF AMERICA

A morning view of the fog rising over the Delaware River at Narrowsburg, N.Y.
(Photo by David B. Soete, October 2004)

Contents

Executive Director's Message 2

Signatory Members 4

- Delaware
- Pennsylvania
- New York
- New Jersey
- Federal Government
- Commission Officers

Commission Staff 6

- Welcome Aboard
- Retirements
- Promotion
- Staff Goodbyes
- Other Noteworthy People News

Basin Plan Officially Adopted in September 2004 8

Hydrologic Summary 10

- 2004: An Active Second Half Includes an Unwelcome Visit from Ivan
- 2005: A Year of Severe Flooding and a Drought Close Call

Interim Fisheries Protection Program Approved in 2004 14

DRBC's Water Quality Initiatives 16

- Lower Delaware Designated as Special Protection Waters
- Commissioners Establish Innovative New Rule to Reduce PCB Levels

Spills on the Delaware 18

- Athos I Oil Spill
- PPL Fly Ash Release

Basin News Briefs 20

- 50th Anniversary of Supreme Court Decree
- Delaware Estuary News
- Pennsylvania Act 220 Water Resources Planning
- Interstate Flow Management Strategy Report Issued
- International Interest in the DRBC Continues
- NPS Director Experiences the Delaware
- A Whale of a Tale
- DRBC Awards
- Project Application Status Web Page

Financial Summary: Cumulative Federal Shortfall Expected to Top $6 Million 23

Map of the Delaware River Basin 24

Executive Director's Message

By Carol R. Collier

As I look back on the two years covered in this publication, several very important accomplishments rise to the top of the long list of activities and projects carried out by the Delaware River Basin Commission:

- The September 2004 signing ceremony in Wilmington, Del. marking the completion of the four-year process to develop the "Water Resources Plan for the Delaware River Basin," a 30-year, goal-based framework that will serve as a guide for all governmental and non-governmental stakeholders whose actions affect water resources in the basin.

- In a collaborative effort to protect the tailwater fisheries below New York City's Delaware River Basin reservoirs, and after years of intensive negotiations, a three-year interim program to provide additional water for fisheries protection was approved by the DRBC in April 2004.

- Based on water quality data collected from 2000 through 2004, the DRBC in 2005 temporarily classified the 76-mile stretch of the non-tidal lower Delaware River between the Delaware Water Gap National Recreation Area to the head of tide at Trenton, N.J. as Special Protection Waters (SPW). The entire 197-mile non-tidal Delaware River is now covered by the DRBC's SPW anti-degradation regulations intended to "keeping the clean water clean."

- The DRBC unanimously adopted a rule in May 2005 to establish "pollutant minimization plans" for point and non-point discharges of PCBs in the Delaware Estuary. The commissioners also set a goal of reducing PCB loadings by 50% in five years.

Over this two-year period, the Delaware River Watershed also witnessed firsthand the effects of natural and man-made events that triggered intensive responses from federal, state, and local government agencies, including the DRBC, and continue to require our collective attention in seeking better ways to protect the public and our water resources. During September 2004 and April 2005, the main stem Delaware experienced the worst flooding since the historic high water levels witnessed fifty years ago during August 1955. Two significant pollution incidents – the November 2004 *Athos I* oil spill and the August 2005 PPL fly ash incident – reminded us that our river has many users existing side-by-side, and that we must be ever vigilant to protect it for the benefit of all.

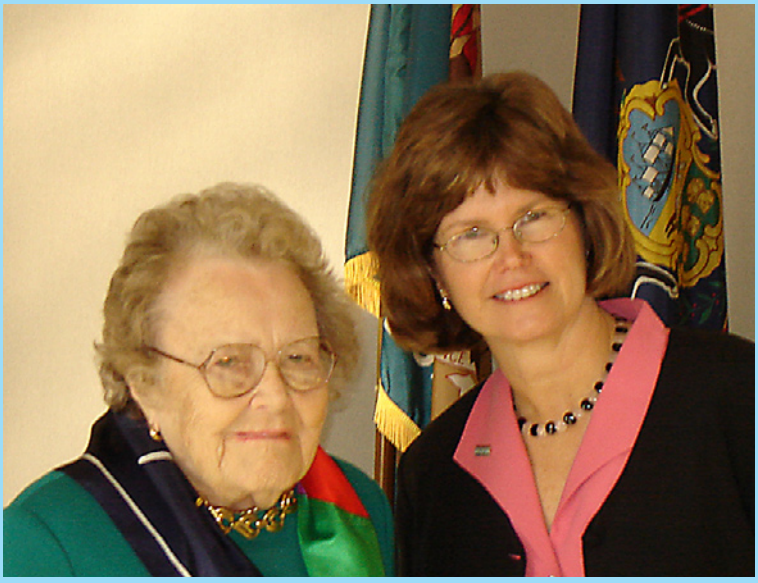
Unfortunately, our continued efforts over 2004 and 2005 to educate the U.S. Congress about the unique, vital role played by the DRBC and the need to restore the federal government's 20 percent contribution towards the commission's annual operating budget proved unsuccessful. With no federal contribution in sight during the DRBC fiscal year that began on July 1, 2005, the cumulative federal shortfall is expected to grow to $6.4 million, more than the size of the commission's annual operating budget. We are grateful to the members of the basin's congressional delegation who have tried to restore federal funding. We also thank the many individuals and organizations who have contacted their federal legislators on our behalf. DRBC staff accomplished much during 2004 and 2005, as will be

explained in this report, but we would have been able to do more if federal funding had been restored.

As we work together to achieve the goals and objectives contained in the 30-year basin plan – thereby protecting our water resources and enhancing our quality of life throughout the basin – let us follow a few basic truths which, borrowing from Thomas Jefferson, water managers hold to be self evident:

- Water does not respect political boundaries.
- Water should be managed on a watershed basis. What happens on the land affects streams and rivers. One cannot manage water without managing the land.
- Water management is not unilateral; it is a collaborative process. We need to engage all levels of government, especially municipal government.
- Downstream water suppliers are dependent on the actions of other upstream users.
- There is not enough water in the Delaware River Basin to support all uses during another drought of record.
- Floods will occur. We cannot stop the flood waters, but we can reduce the losses and damages from flooding. A flood plain is a natural extension of a river and it will flood. We need to keep people out of harm's way as we search for solutions.
- The Delaware River system is sensitive and can change quickly. We need to base our decisions on the range of conditions, not averages.
- We do not know all the answers. A strong base of science is needed to support good decision making. Any river management plan must be flexible, so the parties can adapt as new scientific information and management alternatives become available.

Once again, due to staffing constraints caused by the loss of full signatory funding support of the DRBC's operating budget, this report is covering a two-year period. We hope to return to a single year publication when we publish the 2006 annual report. I encourage you to regularly visit our web site at www.drbc.net for useful and timely information, as well as use the many web links appearing in this report.



Dr. Ruth Patrick and Carol R. Collier at the December 2005 announcement. (Photo by Clarke Rupert)

DRBC Honors Pioneering Ecologist

The DRBC in December 2005 named its to-be-developed office building courtyard the "Ruth Patrick River Garden" in honor of the world-renowned environmental scientist and Philadelphia resident.

"Dr. Ruth Patrick's outstanding career with The Academy of Natural Sciences in Philadelphia has spanned seven decades and her work has set the standard for how the environmental health of rivers and streams is evaluated," DRBC Chairman Kevin C. Donnelly said at the ceremony attended by Dr. Patrick.

Additional information can be found at http://www.nj.gov/drbc/RiverGarden.htm.

Signatory Members


Brigadier General
Merdith W.B. Temple


Major General
William T. Grisoli


New York Governor
George E. Pataki


Pennsylvania Governor
Edward G. Rendell


New Jersey Governor
James E. McGreevey


New Jersey Acting Governor
Richard J. Codey


Delaware Governor
Ruth Ann Minner

According to the 1961 Delaware River Basin Compact creating the DRBC, the members of the commission include the four basin state governors and a federal representative appointed by the President of the United States. A 1997 law later specified that the federal representative must be a member of the U.S. Army Corps of Engineers who holds a presidential appointment as a regular army officer with Senate confirmation.

The five members appoint alternate commissioners, with the governors selecting high-ranking officials from their state environmental agencies. Each commissioner has one vote of equal power with a majority vote needed to decide most issues. Exceptions are votes on the commission's annual budget and drought declarations, which require unanimity.

Delaware

Governor Ruth Ann Minner's alternate was Department of Natural Resources and Environmental Control (DNREC) Secretary **John A. Hughes**. DNREC Water Resources Division Director **Kevin C. Donnelly** and Senior Science Advisor **Harry W. Otto** served as Governor Minner's second and third alternates, respectively.

Pennsylvania

Governor Edward G. Rendell designated Department of Environmental Protection (DEP) Deputy Secretary for Water Management **Cathy Curran Myers** and Division of Water Use Planning Chief **William A. Gast** as his alternate and second alternate, respectively, during 2004-2005.

New York

Department of Environmental Conservation (DEC) Commissioner **Erin M. Crotty,** who served as **Governor George E. Pataki**'s alternate since 2003, left the administration in February 2005. DEC Division of Water Director **Sandra L. Allen** and Assistant Director **Fred R. Nuffer** were Governor Pataki's second and third alternates.

New York City DEP Commissioner **Christopher O. Ward** was the appointed city advisor to the New York State DRBC commissioner until he left the agency in October 2004. **Emily Lloyd**, Ward's successor at DEP, was designated by Mayor Michael R. Bloomberg as the new advisor in February 2005.

New Jersey

Governor James E. McGreevey resigned as the state's chief executive effective November 15, 2004 and was succeeded by **Acting Governor Richard J. Codey**.

DEP Commissioner **Bradley M. Campbell** and Assistant Commissioner for Environmental Regulation **Samuel A. Wolfe** served as alternate and second alternate, respectively, for both governors. DEP Assistant Commissioner for Land Use Management **Ernest P. Hahn** was the third alternate until he accepted the position of executive director of the Delaware and Raritan Canal Commission. Acting Governor Codey appointed **Lisa P. Jackson**, who succeeded Hahn at DEP, to be his third alternate in January 2005.

Federal Government

Brigadier General Merdith W. B. Temple, Commander of the U.S. Army Corps of Engineers North Atlantic Division, was the federal representative appointed by President George W. Bush from February 2003 until he was reassigned to the Corps' headquarters in Washington, D.C. as its Director of Military Programs in the fall of 2005. Brig. Gen. Temple's alternates included **Colonel John P. Carroll**, who retired in 2004, and **Colonel Francis X. Kosich**, who was appointed in July 2004 when he

succeeded Col. Carroll as Deputy Commander for the North Atlantic Division. Col. Kosich was later deployed to Iraq in late-2004. Second alternates included **Lieutenant Colonel Thomas C. Chapman** and **Lieutenant Colonel Robert J. Ruch**, who succeeded Lt. Col. Chapman as Philadelphia District Engineer in July 2004. **Stan Z. Lulewicz**, the Corps' Assistant Chief of Planning in Philadelphia, was named as Brig. Gen. Temple's third alternate in April 2005.

President Bush appointed **Major General William T. Grisoli**, the new Commander of the Corps' North Atlantic Division, as the federal representative in October 2005. Maj. Gen. Grisoli named Lt. Col. Ruch as his alternate and **Lloyd Caldwell,** Director of Programs for the North Atlantic Division**,** as his new second alternate. A third alternate was not named. *(Editor's note: At the time of the presidential appointment, Maj. Gen. Grisoli held the rank of Brigadier General. He was promoted to the rank of Major General in 2006.)*

Commission Officers

The Delaware River Basin Compact requires the annual election of a chair and vice chairs, which historically has been based upon rotation of the compact's five signatory parties. During calendar years 2004 and 2005, the following members served as commission officers:

January 1, 2004 through June 30, 2004 (one-year term began July 1, 2003)
Chair:
New Jersey Governor McGreevey
Vice Chair:
New York Governor Pataki
Second Vice Chair:
Delaware Governor Minner

July 1, 2004 through June 30, 2005
Chair:
New York Governor Pataki
Vice Chair:
Delaware Governor Minner
Second Vice Chair:
Brigadier General Temple

July 1, 2005 through December 31, 2005 (one-year term to end June 30, 2006)
Chair:
Delaware Governor Minner
Vice Chair:
Brigadier General Temple and Major General Grisoli
Second Vice Chair:
Pennsylvania Governor Rendell

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

Commissioners attending the July 2004 conference session in West Trenton included (seated from left to right) Brig. Gen. Merdith Temple (U.S.), Fred Nuffer (N.Y., chair), Cathy Curran Myers (Pa.), Ernest Hahn (N.J.), and Harry Otto (Del.). Standing from left to right are Lt. Col. Robert Ruch (U.S.), William Gast (Pa.), and DRBC Executive Director Carol Collier. (Photo by Clarke Rupert)

Commission Staff

Dennis Herbert

Dennis Herbert, the commission's support services technician who carried out a wide variety of "behind-the-scenes" tasks that kept the office running smoothly, passed away suddenly at his home on January 22, 2005, at the age of 58. He joined the DRBC staff in November 2000 following his retirement from the federal government after 25 years of service.

Dennis was a quiet man with a wonderful sense of humor. It was obvious to the many friends he made at the DRBC that he was a devoted, loving father and grandfather, always happy to talk about his wife of 36 years, Margie, and their nine children and eight grandchildren.

Welcome Aboard!

- **William Muszynski**, Coordinator of Special Projects and Programs, Directorate, 2004. (He is on a temporary, two-year assignment to the DRBC from the U.S. Environmental Protection Agency.)
- **Bridget Ferry,** Secretary, Project Review Branch, 2004.
- **Kim Wobick,** Librarian, Directorate, 2004.
- **Danielle Kreeger**, Estuary Science Coordinator, Directorate, 2005.
- **Jerrell Spotwood**, Support Services Technician, Administrative, 2005.
- **Chad Pindar,** Water Resources Engineer, Project Review Branch, 2005.
- **Katharine O'Hara**, Communications Assistant, Directorate, 2005.
- **Laura Tessieri,** Water Resources Engineer, Operations Branch, 2005.

Retirements

- **Christopher Roberts** – Chris retired in June 2004 after serving more than 18 years as the DRBC's public information officer. An excellent writer who produced a variety of printed publications ranging from annual reports to the award-winning bookmarks and 40th anniversary calendar, Chris also was the commission's spokesman appearing in hundreds of newspaper articles over his DRBC career. His sense of humor is greatly missed.

- **Judith Strong** – Judith retired from her position as librarian in March 2004 after nearly 12 years with the commission.

Promotion

- **Clarke Rupert**, Communications Manager, Directorate, 2005. (He previously served as assistant public information officer and most recently as acting public information officer upon the retirement of Chris Roberts.)

Staff Goodbyes

- **Todd Kratzer,** Water Resources Engineer, Planning and Implementation Branch, 2004. (He accepted a position with N.J. DEP after 16+ years of service at the DRBC.)
- **Lisa Hipp,** Secretary, Project Review Branch, 2004.
- **Patricia McSparran**, Water Resources Engineer, Planning and Implementation Branch, 2004. (She accepted a position with Pa. DEP after nearly five years of service at the DRBC.)
- **Robert Klosowski,** Water Resources Engineer, Operations Branch, 2004.
- **Peter Evans,** Delaware Estuary Program Director, Directorate, 2004. (He became executive director of the Interstate Council on Water Policy in 2005.)
- **Martha Maxwell-Doyle,** Estuary Program Assistant, Directorate, 2004. (As a result of the reorganization of the Delaware Estuary Program, she left the DRBC staff and joined the Partnership for the Delaware Estuary as its deputy director.)
- **Geoffrey Smith**, Field Technician, Monitoring and Modeling Branch, 2005. (He left the DRBC after four years of service to continue his academic work towards an advanced degree.)

(seated from left to right) N.J. Gov. Robert Meyner, Del. Gov. Elbert Carvel, Pa. Gov. David Lawrence, and President John Kennedy at a White House ceremonial signing of the Delaware River Basin Compact on Nov. 2, 1961.

Other Noteworthy People News

The DRBC was saddened by the loss of a number of friends and former colleagues during 2004 and 2005.

- **Delaware Governor Elbert "Bert" Carvel,** who served as chief executive of the "First State" from 1949 to 1953 and 1961 to 1965, died in February 2005 three days before his 95th birthday. He signed the compact creating the DRBC in 1961 and became Delaware's first commission member.
- **Former DRBC Commissioner N.G. Kaul,** who served as New York Governor George Pataki's alternate from 1995 to 2002, died in February 2004 at the age of 57.
- **Former DRBC Commissioner Harold Budka**, who served as New York Governor Mario Cuomo's second alternate from 1992 to 1995, died in January 2005 at the age of 69.
- **Jeanne Marie Vinicombe,** mother of DRBC Watershed Planner Pamela V'Combe, passed away suddenly in May 2005 at the age of 74. Jeanne worked at the DRBC on two occasions, filling in as a secretary in the operations branch and administration office, and did an outstanding job during both staff transition periods.
- **Seymour "Sy" Selzer,** former head of the DRBC planning branch who retired in 1985, died in December 2005 at the age of 82.
- **Paul Webber**, who retired as supervising engineer in 2000 after serving two stints with the DRBC totaling nearly 24 years, died suddenly in April 2004 at the age of 71.
- The DRBC and the Delaware River lost a dear friend when **Fred Lewis** died in April 2004 at the age of 88. The sight of the Lewis Crew hauling shad with nets from the Delaware River has been a springtime tradition in Lambertville, N.J. since 1888 when the fishery was established by Fred's father, William. Operated from an island now bearing the family's name just upstream from the free bridge connecting Lambertville and New Hope, Pa., it is the only remaining commercial shad fishery on the non-tidal river. A lifetime of shad fishing experience on the Delaware prompted an April 2003 *Philadelphia Inquirer* article to describe Fred as "the repository of generations of lore, making him one of the fish's keenest students and most ardent champions." Fittingly, he was laid to rest on the opening day of the 23rd Annual Lambertville Shad Festival, an event he helped start to celebrate the return of good water quality – and shad – to the non-tidal Delaware.
- **Bill Palmer**, former executive director of the Water Resources Association of the Delaware River Basin, passed away in November 2004. Bill had a strong interest in Delaware Basin water issues and was actively involved with the Partnership for the Delaware Estuary.
- **Vern Svatos,** who provided valuable assistance to DRBC staff in efforts to start the Geographic Information System (GIS) program at the commission during the late 1990s, died in July 2004 at the age of 63.

While remembering those who died, we also greeted several new additions to the families of the following DRBC staff members:

- **Siona Hernandez** was born to Librarian Kim Wobick and her husband John Hernandez in November 2004.
- **Rafael Quinodoz** was born to Senior Engineer/Hydrologist Hernan Quinodoz and his wife Maria in May 2005.
- **Joan Bonasera** was born to Geologist/Hydrologist Anthony Bonasera and his wife Sandy in July 2005.
- **Maya Rose Brazell** was born to Water Resources Specialist Gail Blum and her husband James Brazell in July 2005.

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.

Water Resources Plan for the Delaware River Basin: A Common Vision for a Common Resource

Basin Plan Officially Adopted in September 2004

Elected and environmental leaders from Delaware, New Jersey, New York, Pennsylvania, and the federal government joined other interested watershed stakeholders along the Christina Riverfront in Wilmington, Delaware on September 13, 2004 to celebrate the completion of the Water Resources Plan for the Delaware River Basin ("Basin Plan").

"Today's event marks an important milestone that was initiated by a 1999 challenge from the governors of our four basin states along with the federal government to lay out a policy direction for the use, protection, and enhancement of the basin's water resources through the year 2030," DRBC Executive Director Carol R. Collier said at the September 2004 ceremony. "We celebrate a visionary plan that reflects the investment of countless hours of discussion and creativity among many individuals from throughout the Delaware River Basin who responded to the 1999 challenge. However, much work lies ahead as we now strive to develop strategies and take action to realize the goals laid out in this plan over the next 30 years."

Delaware Governor Ruth Ann Minner was joined by Brigadier General Merdith W.B. Temple, Pennsylvania Lieutenant Governor Catherine Baker Knoll, New Jersey Department of Environmental Protection Commissioner Bradley M. Campbell, and New York State Department of Environmental Conservation Division of Water Assistant Director Fred R. Nuffer in a ceremonial signing of a resolution supporting the implementation of the Basin Plan.

A number of federal agency representatives also participated by signing the resolution in affirmation of their agency's support of the Basin Plan. These participants included Jane M. Kenny, Region II Administrator, U.S. Environmental Protection Agency (EPA); Donald S. Welsh, Region III Administrator, EPA; Joe DiBello, Northeast Regional Partnership Programs Manager, National Park Service; Catherine L. Hill, Northeast Regional Hydrologist, U.S. Geological Survey; Marvin E. Moriarty, Region V Director, U.S. Fish and Wildlife Service; and Anthony J. Kramer, N.J. State Conservationist and designated Regional Representative for the U.S. Department of Agriculture Natural Resources Conservation Service.

The Basin Plan provides a goal-based framework that will serve as a guide for all stakeholders – government and non-governmental alike – whose actions affect water resources in the 13,539-square-mile Delaware River Basin that drains portions of the four states.

A Watershed Advisory Council, whose members represented a broad spectrum of basin interests ranging from business and industry to environmental advocacy groups, worked closely with DRBC staff, the commission's standing advisory committees, and ad hoc committees in the facilitated, consensus-building process used to forge the Basin Plan. Council members played an integral part in the development of the plan, devoting many hours in meetings and workshops, in addition to providing a forum for discussion, revision, and finalization.

Prior to the Basin Plan's completion, a series of six public meetings was held between January 20 and March 17, 2004 in Delaware (Dover), New Jersey (Millville and Bordentown), Pennsylvania (Bethlehem and Philadelphia), and New York (Narrowsburg) in order to solicit public comment on a draft

plan. Comments received throughout the public process were incorporated into the Basin Plan where appropriate, further emphasizing the plan's goal of being a collaborative effort.

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.

The goal-based plan to guide policy and action includes five desired results:

- An adequate and reliable supply of suitable quality water to sustain human and ecological needs through 2030;
- Managing the system of waterway corridors to reduce flood losses, improve recreational experiences, and protect, conserve, and restore riparian and aquatic ecosystems;
- Integrating water resource management considerations into land use planning and growth management while recognizing the social and economic needs of communities;
- Strengthening partnerships for the management of water resources among all levels of government, the private sector, and individuals sharing an interest in sustainable water resources management; and
- Providing opportunities to enhance appreciation and commitment to the protection, improvement, and restoration of the basin's water resources.

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.

Also on hand to join the celebration was Benjamin H. Grumbles, Acting Assistant Administrator for EPA's Office of Water, who offered remarks about the two-and-a-half day conference, "Watershed Summit on the Delaware: Making the Connection," which followed the ceremonial signing event. The September 13-15 conference, also held in Wilmington, covered a wide range of environmental issues in the Delaware River Basin by encouraging communication, outreach, and partnerships. One panel session discussed the Basin Plan and how it provides a framework for water resources management. The summit was sponsored by the EPA and DRBC, with the support and assistance of a number of additional agencies and organizations.

The Basin Plan is available for viewing on the DRBC web site at http://www.nj.gov/drbc/basinplan.htm. Copies also can be requested by contacting the DRBC at (609) 883-9500.

Following the completion of the Basin Plan in September 2004, DRBC staff initiated efforts to organize the commission's six-year strategic water resources program and annual work plan to clearly align DRBC program priorities with the Basin Plan's goals and objectives. The water resources program covering fiscal years 2006 through 2012, which was adopted by the commissioners on September 26, 2005, reflects the transition in DRBC annual program reporting to include multiple-year planning to accomplish both the directives of the Delaware River Basin Compact and the Basin Plan's goals pertinent to the commission's mission. The annual work plan for each year, extracted from the six-year program, explains in greater detail planned activities and allotment of resources in the fiscal year necessary for those tasks.

Hydrologic Summary 2004-2005

2004: An Active Second Half Includes an Unwelcome Visit from Ivan

A drier than normal weather pattern persisted throughout much of the Delaware River Basin during the early months of 2004. Observed precipitation for the basin above Trenton, N.J. from January through July 11 was 3.85 inches below normal, while precipitation for Wilmington, Del. was 3.16 inches above normal. Reflecting this trend, streamflows throughout the basin were in the below-normal to normal range from February through June. The New York City (NYC) reservoirs in the upper Delaware River Basin began 2004 brimming with storage due to the abundance of precipitation that fell during 2003. Storage gradually declined through early March, but remained above the long-term median. A gradual melting of the snowpack above the reservoirs began a seasonal increase in storage and by early April, the NYC Delaware Basin reservoirs had refilled and were spilling excess water into the tributaries below.

The second half of 2004 proved an active time for intense weather systems in the Delaware River Basin with some near misses and, unfortunately, several direct hits.

- **July 12-13:** A slow moving system dropped rainfall averaging four to six inches on the lower basin. Portions of southcentral New Jersey were the hardest hit as more than a foot of rain fell in some localities. Tabernacle, N.J. received a staggering 13.2 inches of rain during what was determined to be a one-in-one-thousand year storm event for that Burlington County municipality.

- **August 1**: Heavy rainfall returned to portions of the lower basin. Two Delaware County, Pa. communities – Upper Darby and Darby Borough – bore the brunt of the storm, receiving more than five inches of rain.

- **August 12-14**: A strong storm system and two tropical storms were predicted to drench the basin over a three-day period. During the evening of Aug. 12, storms rolled through the basin producing more than seven inches of rain over the headwaters of the Schuylkill River. On Aug. 13, forecasters were anticipating the arrival of Tropical Storm Bonnie. With the basin's streams and rivers already brimming from the storms the night before, there was a potential for serious flooding. Fortunately, Bonnie only affected the very southern portion of the basin with moderate rainfall.

  On Aug. 14, the basin was gearing up for yet another potential soggy blow from Tropical Storm Charley, which had already devastated portions of Florida as a category four hurricane. However, the majority of the basin was spared from Charley's wind and rain when the storm tracked further east than expected.

- **September 17-18**: The near misses of tropical activity finally caught up with the basin when the remnants of Tropical Storm Ivan, interacting with a cold front that dropped into the region, produced tremendous rainfall amounts across northeast Pennsylvania and southern New York. Most of the basin upstream of Trenton received three to five inches of rain in a 12-hour period, with some isolated areas receiving as much as seven or eight inches. Much of the heavier rain occurred

Sampling of DRBC Flood-Related Activities During 2004 and 2005:

- Thanks to a $10,000 flood hazard education and outreach grant awarded by the N.J. Emergency Management Office in 2004, DRBC staff improved and expanded the flood information appearing on the commission's web site at http://www.nj.gov/drbc/Flood_Website/floodinf.htm.
- DRBC Executive Director Carol R. Collier served on the N.J. Flood Mitigation Task Force created by Acting Governor Richard Codey following the April 2005 flood. Other DRBC staff participated on the technical, finance, and public outreach subcommittees. (Editor's note: The final task force report was released by Governor Jon Corzine in August 2006.)
- DRBC and PPL Corporation cosponsored a May 2005 informational workshop for public officials in Hawley, Pa. The purpose of the workshop, attended by about 75 persons, was to review the facts regarding the April 2005 flood and to provide a forum for discussions regarding reservoir operations, flood warning, and mitigation.
- DRBC staff participated in flood-focused public information meetings during 2005 hosted by Pa. State Rep. David Steil (R-Bucks) in Yardley on June 2 and by U.S. Rep. Charles Dent (R-Pa.) in Easton on August 2.

in the mountainous regions of the basin in the Poconos and Catskills, while many areas in the southern half of the watershed received an inch or less. This rain fell on soils already saturated by the wet summer, including Tropical Storm Frances just a week before, creating a "parking lot" runoff effect over a very large portion of the basin's drainage area. Even before the rains from Ivan arrived, the Delaware River at Montague, N.J. and Trenton was flowing at 298 percent and 265 percent of normal, respectively, for the first half of September.

The flooding on the main stem Delaware River was the worst since August 1955 when the basin was hit by the remnants of two hurricanes, Connie and Diane, in one week. Flood damages were sustained up and down the main stem and its tributaries, resulting in presidential disaster declarations for portions of Pennsylvania, New Jersey, and New York. New warning products and other tools that were developed or upgraded since the last time major flooding occurred along the Delaware in January 1996, such as the National Weather Service's Advanced Hydrologic Prediction Service (AHPS), helped to provide the necessary lead time to get hundreds of people out of harm's way.

- **September 28**: The remnants of Tropical Storm Jeanne brought four to eight inches of rain to the Philadelphia metropolitan area, impacting portions of Delaware, Pennsylvania, and New Jersey. The heavy precipitation caused widespread, rapid urban and small stream flooding during the evening hours, making roadways hazardous and evacuations difficult.

The majority of counties within the basin reported normal to above-normal precipitation over the entire year, with annual departures ranging from 3.6 inches below normal in Sussex County, Del. to 15.5 inches above normal in Lackawanna County, Pa. Annual observed precipitation at selected stations above Trenton was 53.38 inches, or 8.49 inches above normal, while 56.75 inches (13.94 inches above normal) fell in Wilmington.

With the exception of a brief period in July, storage in the NYC Delaware Basin reservoirs remained above the long-term median for the second half of 2004 and combined storage ended the year the same as it began – well above the long-term median. Over the period June 17-July 17, approximately 10.6 billion gallons (bg) of water was released from these reservoirs in order to meet the minimum flow target at Montague as required by the 1954 U.S. Supreme Court decree.

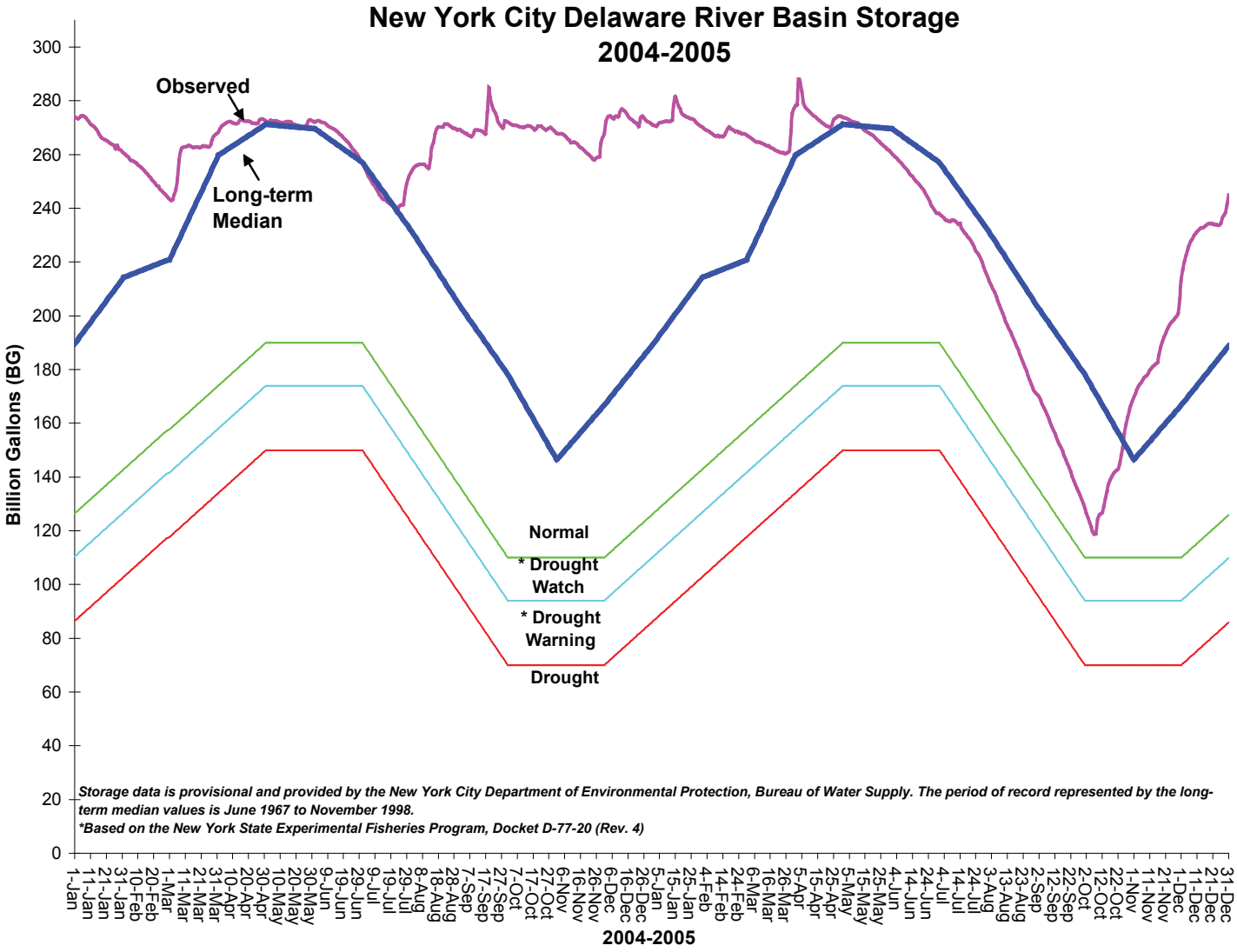
No releases were required during 2004 from the Beltzville Reservoir (located on a tributary of the Lehigh River) and Blue Marsh Reservoir (located on a tributary of the Schuylkill River) to meet the minimum flow target at Trenton. Moreover, no releases were required from the Merrill Creek Reservoir, located near Phillipsburg, N.J., to replace evaporative water losses resulting from power generation in the basin under certain drought conditions.

2005: A Year of Severe Flooding and a Drought Close Call

For the third year in a row, the NYC Delaware Basin reservoirs began with above-normal storage (270.990 bg, or 100.1% of usable capacity, and 81.427 bg above the long-term median).

Two early spring rainstorms in 2005 – the first on March 28-29 and the second on April 2-3 – combined with snow melt to cause major flooding on the main stem Delaware.

Photo showing April 4, 2005 flooding in New Hope, Pennsylvania and Lambertville, New Jersey. (Photo courtesy of John Jenks/USGS- NJ)



This graph shows the observed combined water storage in the NYC Delaware Basin reservoirs (Cannonsville, Pepacton, and Neversink) during 2004 and 2005, as well as the long-term median and drought rating curves. The declining actual storage line was very close to crossing the green drought watch curve in October 2005 before rebounding.

The first of these two storms brought more than two inches of rain to the western and northern portions of the basin. Warm temperatures accompanied the rain and melted roughly half of the two to four inches of water equivalent that had been stored in the snow lying in the northern watersheds of the basin. Less than a week after the first storm, the second rain event dropped an additional two to three inches of rain over the Delaware River's headwaters in New York's Catskill Mountains, melting nearly all of the remaining snow pack. Three to five inches of rain also soaked the middle portion of the basin. In total, the upper portions of the basin received five to seven inches of rain in addition to the two to four inches of water released during the snow melt. The rest of the basin received four to eight inches of rain during the weeklong period.

The basinwide scale of this event produced flood crests on the main stem Delaware River exceeding those reached during the remnants of Tropical Storm Ivan only six-and-a-half months earlier. Once again, the

basin endured evacuations, bridge and road closures, and extensive damage. On April 3, the Delaware River at Montague crested at 31.69 feet (ft), the third highest on record. On April 4, the Delaware River at Trenton reached 25.33 ft, the fourth highest recorded crest. Impacted counties in Pennsylvania, New Jersey, and New York again received federal disaster declarations by President Bush.

As the April 2005 flooding victims assessed damages and moved into the cleanup phase, Mother Nature reminded the basin how quickly we can move from one extreme to another. The rains of late March and early April combined with snowmelt to boost storage in the NYC Delaware Basin reservoirs to a recorded high of 288.588 bg on April 3. However, a drier than normal May caused reservoir storage levels to decline along with streamflows at many locations throughout the basin. By mid May, NYC Delaware Basin reservoir storage had dropped below the long-term median and the first directed releases were required on May 23 in order to meet the minimum flow target at Montague. Late spring and summer rainfall deficits, especially during August and September, caused storage to drop sharply away from the median. Mounting precipitation deficits took their toll on the basin's hydrology as ground water levels declined and continued releases were required from both the NYC and lower basin reservoirs to augment Delaware River flows. From May 23 through October 9, just over 70 bg was released from the NYC Delaware Basin reservoirs to meet the minimum flow target at Montague. In addition, nearly 1.5 bg was released from the lower basin reservoirs (Blue Marsh and Beltzville) between August 5 and September 20 to meet the Trenton minimum flow target. No releases were required from Merrill Creek Reservoir during 2005.

In response to the dry conditions, New Jersey officials issued a statewide drought watch on September 13, urging residents to voluntarily conserve water. The DRBC's drought operating program is automatically triggered by declining storage in the three NYC Delaware Basin reservoirs through the use of a drought rating curve (*please refer to the graph on the facing page*). By the end of September, it was estimated that we were only several weeks away from a basinwide drought watch if the dry conditions persisted.

As the April 2005 flooding victims assessed damages and moved into the cleanup phase, Mother Nature reminded the basin how quickly we can move from one extreme to another.

However, relief came on October 7-8 with the arrival of the remnants of Tropical Storm Tammy, which produced rainfall in the four to eight inch range for much of the basin, with locally higher amounts of eight to 12 inches estimated by dopplar radar. New Jersey ended its statewide drought watch on October 12. By month's end, streamflows and ground water levels had dramatically improved throughout the entire basin.

Despite the very dry periods during 2005, the majority of basin counties reported normal to above-normal annual precipitation over the entire year, with departures ranging from 1.50 inches below normal in Cape May County, N.J. to 9.40 inches above normal in Sussex County, N.J. Annual observed precipitation at selected stations above Trenton was 51.12 inches, or 6.23 inches above normal, and 40.30 inches, or 2.51 inches below normal, at Wilmington.

The upper and lower basin reservoirs rebounded following the ample rainfall that resumed in October. Storage in the NYC Delaware Basin reservoirs continued to increase and remained above the long-term median during the normal recharge period of fall and early winter. The year closed with the three NYC Delaware Basin reservoirs holding about 245 bg (90.5% of usable storage), or 56 bg above the long-term median storage for December 31.

Uncontrolled spills from the three NYC Delaware Basin reservoirs that occurred when they were over 100% capacity during 2005 totaled about 197 bg compared to approximately 219 bg during 2004 and nearly 371 bg in 2003. The hydrology of 2005 showed that annual totals and averages can be misleading given the extremes that occurred during the year.

More detailed information about the basin's hydrologic conditions, including a comprehensive flooding section, can be found on the DRBC web site at http://www.nj.gov/drbc/hydro.htm.

Interim Fisheries Protection Program Approved in 2004

The upper Delaware River Basin is home to some of the finest trout fishing found anywhere in the United States. However, the well-being of this fishery depends on cold-water releases from three reservoirs built by New York City (NYC) on Delaware River tributaries and operated for public water supply.

Allocation of the waters in the upper basin is governed by a decree of the U.S. Supreme Court issued in 1954 to settle an interstate water dispute between the City and State of New York and the lower basin states. The decree parties are the four basin states (Delaware, New Jersey, New York, and Pennsylvania) and NYC. The 1954 decree allows the city to export up to 800 million gallons per day out of the Delaware Basin, establishes a minimum flow target at Montague, N.J. for the use of the lower basin states, and provides for reservoir releases to meet the target when necessary.

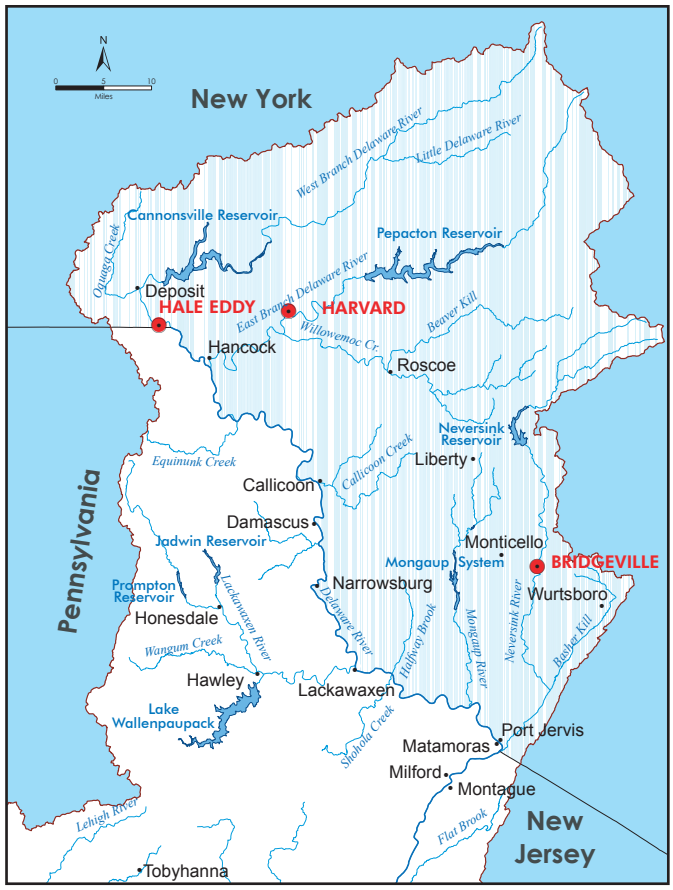
The 1954 decree did not establish minimum flows for fisheries protection. However, the 1961 compact creating the DRBC allows for adjustments to be made to the decree's prescribed releases and diversions, subject to the unanimous consent of the decree parties, without requiring further court approval. As a result, fishery-related negotiations among the decree parties have taken place since 1977 and various reservoir release programs for fisheries protection have been agreed to over the years.

In 2002, New York State presented a proposal to the other decree parties to revise the existing reservoir releases program to provide additional water for fishery protection. After lengthy negotiations among the decree parties and with their unanimous consent, an interim fisheries protection program extending from May 2004 through May 2007 was approved by the DRBC on April 21, 2004.

This program for the first time establishes minimum flow targets for fisheries protection below each of the NYC reservoirs during normal conditions: 225 cubic feet per second (cfs) at Hale Eddy, N.Y. below Cannonsville Reservoir, 175 cfs at Harvard, N.Y. below Pepacton Reservoir, and 115 cfs at Bridgeville, N.Y. below Neversink Reservoir. These targets were recommended by New York State Department of Environmental Conservation (NYSDEC) fisheries biologists based on a trout habitat study completed in 1983. The flow targets are proportionally reduced during various drought stages. Along with the flow targets, an expanded water bank was made available to make additional cold-water releases to attempt to limit high instream water temperatures that are harmful to trout.

The interim fisheries protection program was possible, in part, because PPL Corporation offered additional water from its Lake Wallenpaupack hydropower reservoir in northeastern Pennsylvania to be used at the commission's discretion during drought watch, warning, and emergency operations to meet minimum flow targets. The interstate collaboration through the DRBC helped bring this Pennsylvania power company to the aid of the New York fisheries program.

Based on results of the three-year program and on further deliberations regarding the sustainability of water available to support fishery releases, the decree parties intend to develop and implement a more flexible program of reservoir releases to better address the needs of the upper basin fisheries. Up until now, the NYC Delaware Basin reservoir operating plans have been drought-focused. However, in light of the major floods on the Delaware which followed a period of nearly

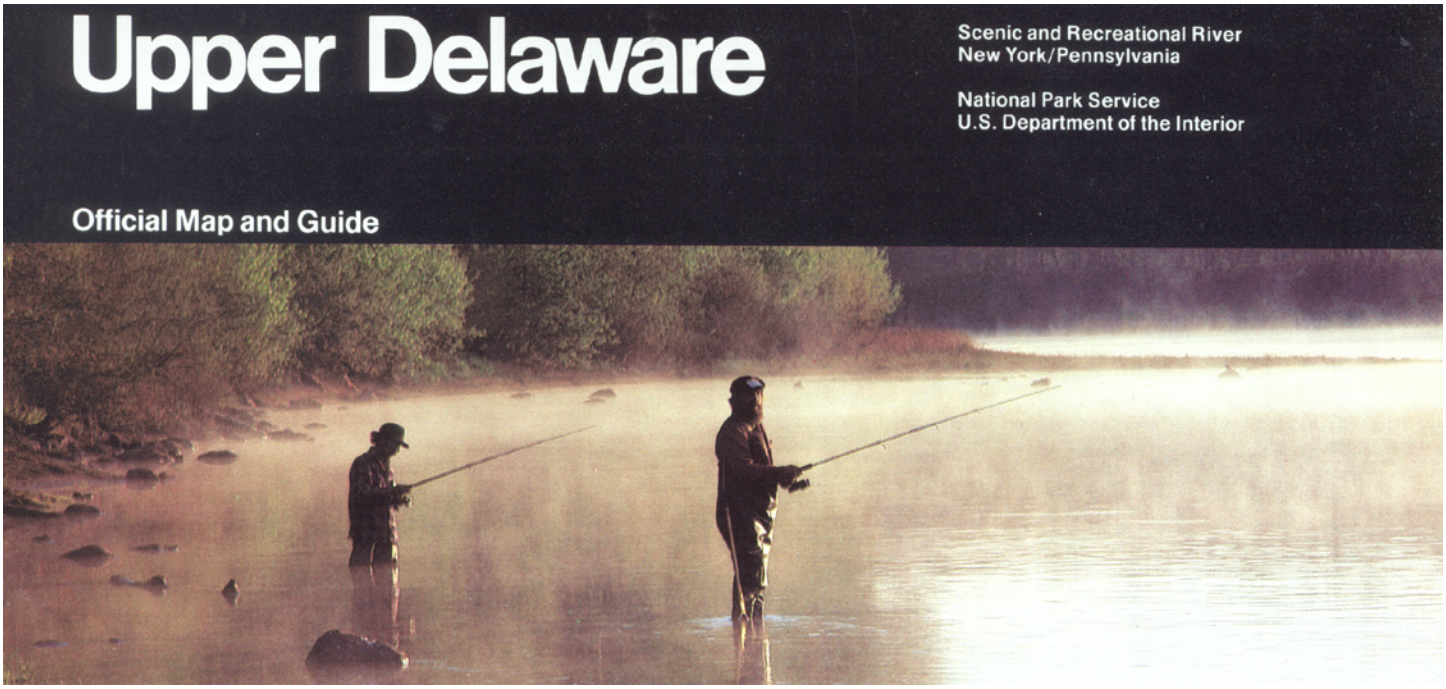


This map of the upper Delaware River Basin highlights in red the location of the three minimum flow targets for fishery protection.

50 years without any widespread main stem flooding, potential flood mitigation opportunities using existing reservoirs is yet another issue under consideration by the decree parties. As deliberations continue, fishery interests must be balanced by the other competing demands on the main stem Delaware River and Delaware Bay. Also, the federal Endangered Species Act requires that river flows be managed to protect certain species such as the dwarf wedgemussel, which was recently discovered in the waters of the upper Delaware.

A number of ongoing ecological and hydrological studies by multiple public and private stakeholders are underway to provide the decree parties and DRBC with better information to guide decision-making. For example, a study to update the 1983 NYSDEC cold-water fishery habitat study is being conducted by the U.S. Geological Survey with the assistance of the DRBC Subcommittee on Ecological Flows (SEF). The SEF is currently chaired by Colin Apse with The Nature Conservancy's Neversink River Program. Ongoing studies also are underway to better understand instream flow needs of dwarf wedgemussels and oysters.

Additional information about this program can be found on the DRBC web site at http://www.nj.gov/drbc/Res-Fisheries.htm.



DRBC's Water Quality Initiatives

Water quality protection is one of the DRBC's most important responsibilities and in recognition of water quality differences found along the 330-mile-long Delaware River and Bay, the commission uses two approaches to carry out this program. In those areas where monitoring has shown that water quality is actually better than minimum standards, the DRBC's Special Protection Waters (SPW) regulations, adopted in 1992, are designed to protect existing high water quality in order to "keep the clean water clean." Where monitoring tells us that we are not meeting water quality standards, efforts are undertaken to reduce pollution loads with the goal of cleaning up the water in order to meet those standards. Several important efforts were undertaken during 2004 and 2005 to advance both of these water quality approaches.

Lower Delaware Designated as Special Protection Waters (SPW)

In 2000, President Bill Clinton signed the Lower Delaware Wild and Scenic Rivers Act into law adding 38.9 miles of the main stem Delaware (and about 28 miles of selected tributaries) between the Delaware Water Gap and Washington Crossing, Pa., to the National Wild and Scenic Rivers System.

DRBC staff began collecting extensive water quality data in 2000 for a comprehensive water quality study of the "Wild and Scenic" Lower Delaware and its drainage area. In April 2001, the Delaware Riverkeeper Network petitioned the commission to designate the 76-mile stretch of the non-tidal Lower Delaware from the Delaware Water Gap National Recreation Area downstream to the head of tide at Trenton as SPW. The five years of data collected from 2000-2004 indicated that the Lower Delaware River is characterized by exceptionally high scenic, recreational, and ecological values and water supply uses which, in the opinion of DRBC staff, require special protection. As a result, the DRBC proposed in 2004 to amend its SPW regulations to include this 76-mile stretch.

Informational meetings were held during October 2004 in Easton, Pa. and Stockton, N.J. in order to educate the public about the proposed rulemaking and a hearing followed later that month. The DRBC commissioners on January 19, 2005 temporarily classified the 76-mile stretch as SPW through September 30, 2005. The commission has twice extended the temporary designation through September 30, 2006 and most recently through September 30, 2007. The numeric values for existing water quality and permanent SPW designation of the Lower Delaware are expected to be approved through a rulemaking process in 2007.

Including the temporary classification of the Lower Delaware stretch, the entire 197-mile non-tidal river above Trenton is now covered by the SPW anti-degradation regulations.

Additional detailed SPW information, including the reports which led to the temporary SPW Lower Delaware designation, are available online at http://www.nj.gov/drbc/spw.htm.

Commissioners Establish Innovative New Rule in 2005 to Reduce PCB Levels in the Delaware River

The DRBC on May 18, 2005 unanimously adopted a rule to establish pollutant minimization plan (PMP) requirements for point and non-point discharges of polychlorinated biphenyls (PCBs) in the Delaware Estuary. The commissioners also set a goal of reducing PCB loadings by 50% in five years.

"We believe this progressive action taken by the commissioners to require waste minimization and reduction plans will prove to be a significant pollution control milestone in the continuing efforts to reduce levels of PCBs in the tidal Delaware River and Bay," DRBC Executive Director Carol R. Collier said when the PMP rule was adopted. "While the ultimate goal of the commission and its members is to meet water quality standards and eliminate fish consumption advisories, establishing a target reduction in PCB loadings of 50% in five years provides an important benchmark for judging the effectiveness of pollutant minimization plans over the short term," Collier added.

In December 2003, the U.S. Environmental Protection Agency (EPA) established Stage 1 Total Maximum Daily Loads (TMDLs) for PCBs in the tidal Delaware River between Trenton and the Delaware Bay under a court-mandated deadline based on several years of technical work conducted by the DRBC. A TMDL sets the maximum amount of a pollutant that a water body can receive without violating applicable water quality standards and allocates that amount among sources in the watershed – both point (end-of-pipe) and non-point (runoff). Dischargers must reduce loads to the allocated levels in order to achieve and maintain the standards.

A non-numeric approach to implementing the Stage 1 TMDLs was taken, in part because it was understood that dischargers could not reduce their PCB loadings quickly enough to comply with numeric limits. The PMP rule embodies the

principle of adaptive management, which encourages experimentation, measurement, and readjustment depending on the results of the actions taken. It reflects an awareness that while dramatic reductions in loadings from all source categories will be required to achieve the PCB TMDLs over several decades, uncertainty as to the effectiveness of any particular reduction activity currently persists.

The May 2005 rule provides the commission with the regulatory authority to require PMPs before permits are reissued by the states, thus ensuring that steps to improve the estuary's water quality begin sooner. In December 2005, New Jersey proposed its own PMP regulation modeled after the commission's rule.

Under the DRBC's PMP rule, dischargers will identify known and potential sources of PCBs emanating from their facility, identify procedures for tracking down unknown sources of the pollutant, and identify and implement strategies for minimizing or preventing releases from all identified sources. Dischargers will measure and annually report progress made in reducing loadings. Initially, 42 permittees were required to develop and implement PMPs and to monitor their PCB discharges.

In light of the importance of contributions of PCB pollution from non-point sources, the rule allows the commission to require PMPs for contaminated sites where releases from the sites are not being addressed entirely through other state or federal regulatory programs.

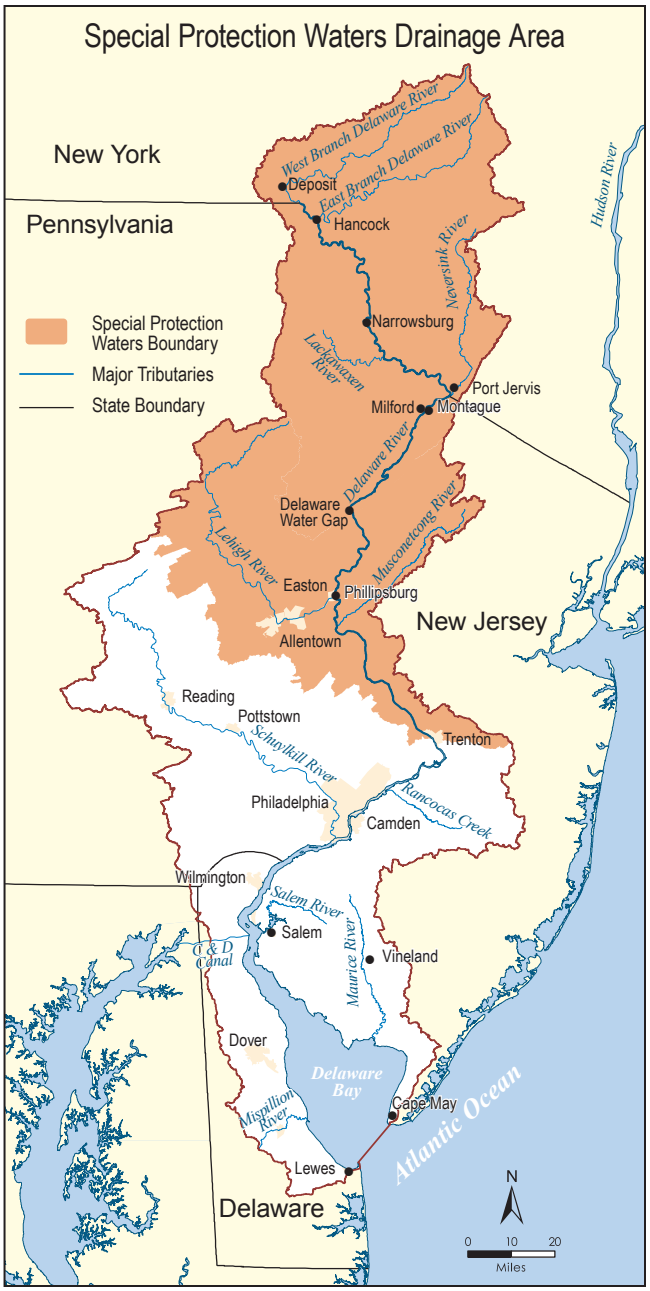
"Commission staff began drafting this proposal in May 2004, and it has benefited from extensive public input," Collier said. "Representatives from industry, municipal wastewater treatment plants, environmental organizations, and regulatory agencies all have expressed support for this approach to reducing PCB contamination in the Delaware River and Bay."

The commissioners provided that a peer review advisory committee will be established to evaluate the PMPs and advise regulators on their anticipated effectiveness. The committee also will provide advice on additional measures that may be practicable.

PCBs, which have been classified by the EPA as a probable human carcinogen, are present in the waters of the Delaware Estuary at concentrations up to 1,000 times higher than the water quality criteria. The U.S. banned the manufacture and general use of PCBs in the late 1970s, but not before 1.5 billion pounds of the substance was produced. PCBs were used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. Despite the ban, equipment containing PCBs is still in use due to the extended life span of the equipment. 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.

As part of the outreach effort to explain PMP requirements to impacted dischargers, over 100 persons attended a July 2005 workshop cosponsored by the New Jersey Water Environment Association and the DRBC which was held at the Rutger's EcoComplex in Bordentown, N.J.

Additional information, including the powerpoint presentations provided at the July 2005 workshop, can be viewed on the DRBC web site at http://www.nj.gov/drbc/PMP_info.htm.



Spills on the Delaware

Two major spills into the tidal and non-tidal Delaware River during 2004 and 2005 required intensive cleanup responses from numerous public and private stakeholders, including the DRBC.

Athos I Oil Spill

On the evening of November 26, 2004, the 750-foot Greek tanker *Athos I* struck a submerged object in the Delaware River, puncturing the vessel's bottom plating and releasing an estimated 264,000 gallons of heavy crude oil into the river. The ship was carrying 13 million gallons of the slightly buoyant, very sticky oil that can easily form into tar balls. The incident occurred as the *Athos I*, which had a single bottom and double-sided hull, approached the Citgo Asphalt Refining Facility in Paulsboro, N.J. near river mile 90 across the Delaware from Philadelphia. The U.S. Coast Guard later recovered the object – an 18,000 pound anchor – but investigators could not identify its owner nor establish how long it was submerged.

The spill prompted the Coast Guard to initially close the river for a 27-mile stretch downstream from the Tacony Palmyra Bridge (river mile 107). Restrictions were gradually relaxed and the river was open to all marine traffic by December 8. The intensive response effort at one point involved more than 1,800 federal, state, and local officials and contractors, 150+ vessels, and the deployment of over 20 miles of spill containment boom. By February 1, 2005, it was reported that 366 birds were cleaned and released, while another 178 birds could not be saved.

The active spill cleanup of nearly 57 miles of shoreline in Pennsylvania, New Jersey, and Delaware, of which about five miles was heavily impacted, concluded a year later and resulted in the removal of more than 18,000 tons of oily solids (cleanup materials and oil) at a total estimated cost of over $150 million.

While not a first responder agency, DRBC staff members used their knowledge of the river and technical expertise to provide assistance to the unified command response team headed by the Coast Guard. Modeling and Monitoring Branch staff members led by Dr. Thomas Fikslin worked with the response modeling team located in Seattle, Washington to help determine the extent of oil spread and locations of priority cleanup actions using commission models developed for the movement of toxic pollutants through the tidal river and bay. As the visible oil sheen reached within a few miles of the City of Philadelphia's drinking water intake, DRBC staff also worked with state environmental and city officials to ensure that sufficient sampling was being conducted. In addition, staff provided technical advice on the question of toxicity of possible cleaning agents under consideration for use on oil-contaminated vessels in order to minimize environmental impacts.

As a result of this incident, the Coast Guard-led unified command response team became more familiar with the DRBC's resources – including data collection, technical expertise, and overall agency knowledge of the estuary – that could be tapped into when responding to future spills. DRBC staff members now regularly attend and participate in training sessions and meetings of the Philadelphia Port Area Committee held throughout the year to prepare for such incidents.

A U.S. House of Representatives subcommittee, chaired by Congressman Frank LoBiondo (R-N.J.), held a field hearing on the oil spill in Philadelphia on January 18, 2005. In response to what was learned at the hearing, LoBiondo along with Representatives James Saxton (R-N.J.), Robert Andrews (D-N.J.), Michael Castle (R-Del.), and Allyson Schwartz (D-Pa.), introduced the Delaware River Protection Act, H.R. 1412, on March 17, 2005. Several important provisions contained in H.R. 1412 were later incorporated into another bill that was signed into law on July 12, 2006. They included:

- Requiring mandatory reporting of objects that are lost overboard to the Coast Guard for immediate recovery;
- Encouraging the use of double hull tankers by more than doubling the liability limits on single hull tankers under the federal Oil Pollution Act;
- Updating the oil spill contingency plan for the Delaware River and Bay to ensure the protection of environmentally sensitive habitats and locations;
- Creating a new committee to report to Congress on ways to improve oil spill response and prevention; and
- Establishing a pilot project on the Delaware River and Bay to test techniques to recover submerged oil.

Athos I the day after it struck a submerged object causing an oil spill in the Delaware River. (Photo courtesy of the U.S. Coast Guard)

PPL Fly Ash Release

A leak developed on the evening of August 23, 2005 in one of the fly ash settling basins on the property of PPL Corporation's Martins Creek power plant in Lower Mount Bethel Township, Northampton County, Pa. Wooden stop logs that hold back water and fly ash (a by-product of burning coal in the power generation units) in the 40-acre basin breached, allowing a discharge of fly ash slurry to move from the basin over land to Oughoughton Creek and then to the nearby Delaware River. Without a gate valve or built-in structure to stop the flow of the accidental release, PPL had a difficult time plugging the leaking ash storage pond. By the time the flow stopped on August 27, approximately 100 million gallons of contaminated water and fly ash was released into the Delaware River. The City of Easton, Pa., the closest downstream surface water user, temporarily shut down its drinking water intake and imposed water use restrictions as a precaution.

The Delaware Valley Early Warning System (EWS) was activated upon receiving notification of the incident on August 25. The EWS, which was developed by the Philadelphia Water Department with a grant awarded by Pennsylvania DEP, alerts partners about spills and shares important information. It is comprised of water suppliers and government agencies from both Pennsylvania and New Jersey, including the DRBC, and became operational in October 2003.

PPL used contractors to remove the fly ash from the river and other impacted areas, an activity that continued into 2006. A new stoplog assembly made of steel-reinforced concrete, a reinforced steel wall on the basin side of the discharge structure, and installation of two shutoff valves on the pipeline between the discharge structure and the river were in place by October 2005. The company also tested and continues quarterly testing of more than 230 residential wells in Pennsylvania and New Jersey at the request of property owners. PPL reported on November 1, 2005 that costs associated with the leak would exceed $30 million.

Post-release water quality sampling was conducted by PPL, Pennsylvania and New Jersey DEPs, New Jersey Water Supply Authority, DRBC, Philadelphia Water Department, and the U.S. Geological Survey. The DRBC hosted a meeting with agency and PPL representatives at its West Trenton offices on November 3, 2005 to review the data collected up to that point. Pennsylvania and New Jersey representatives requested that DRBC staff compile and assess the collected water column data. This assessment of over 1,800 samples can be viewed on the DRBC web site at http://www.nj.gov/drbc/FlyAshAssessment_061906.pdf. Although it appears that there were no immediate harmful effects caused by the release, biological and other studies continue in order to determine any possible longer term impacts to the river. The DRBC had been monitoring water quality in this stretch of the river for several years prior to the release, so the commission has good "baseline" data to help to determine the existence of possible environmental impacts. A feasibility study is planned to determine whether a real-time water quality monitor should be installed along the river in the vicinity of the PPL power plant. There are currently no public water supply intakes on the main stem Delaware River north of Easton.

As was the case in the *Athos I* oil spill, a Natural Resource Damage Assessment team comprised of federal and state agencies – often referred to as "trustees" – has been formed to identify the extent of resource injuries, the best methods for restoring those resources, and the type and amount of restoration required.

Automation of a Hydrodynamic Model for the Tidal Delaware for Rapid Assessment of Spill Impacts on Water Intakes

The tidal Delaware River provides drinking water for nearly two million people. This same portion of the river also is home to a dense concentration of chemical, petroleum, and manufacturing facilities. Because the tidal influence on the river results in upstream as well as downstream water movement approaching 12 miles every 12.5 hours, water intakes are at risk from both downstream and upstream spills. Over a dozen documented spills have occurred in the last 20 years.

Nationally available time-of-travel tools have been developed for non-tidal rivers, but they do not address the complex hydrodynamics of tidal systems like those found in the Delaware Estuary. During a contaminant release event, water utility managers need to know which intakes will be impacted, as well as the timing and likely duration of the impact, in order to determine how to use limited water reserves most efficiently while protecting drinking water and infrastructure. Up-to-date hydrodynamic conditions and realistic future hydrologic inputs are one of the key components to depict the dispersion of any spill event and to provide relatively accurate predictions for decision makers. *However, recent spill responses have demonstrated that the time required to populate, run, and process a hydrodynamic and subsequent mass transport and fate model probably exceeds the critical first tidal cycles after the spill.*

Following the *Athos I* spill, DRBC Water Resource Engineers/Modelers Dr. Namsoo Suk and John Yagecic developed an automated system to retrieve and process current hydrological and meteorological data, create a model input file, run an existing hydrodynamic model, and process the output. The hydrodynamic model was recently updated and calibrated by DRBC as part of the PCB total maximum daily load (TMDL) for the Delaware Estuary, which extends from the mouth of the bay where it meets the Atlantic Ocean to the head of tide at Trenton, N.J. This model is run overnight, every night, without user input. This system obtains both recent observations and forecasts of upstream freshwater flows via the Internet from the U.S. Geological Survey and the National Oceanic and Atmospheric Administration (NOAA) as well as tidal boundary elevations from NOAA. The model includes a forecast typically extending five days into the future. The automated flow and transport model has been operational since January 2006.

Upon notification that a spill has occurred, the most recent hydrodynamic prediction file can be coupled with a dispersion model to predict the relative concentration of the contaminant in the vicinity of water intakes. *By automating the hydrodynamic modeling, the time required to develop a contaminant transport prediction can be reduced dramatically.* Utilizing three- to five-day upstream inflow predictions from the National Weather Service, the model can generate near term estuary hydrodynamic forecasts. In addition, periodic confirmation runs ensure that the model is functioning properly in time of need. Since all the applications utilize widely available standard business software, this concept is easily transferable to other systems and other model platforms.

Basin News Briefs

50th Anniversary of Supreme Court Decree

June 7, 2004 marked the 50th anniversary of the 1954 U.S. Supreme Court decree that resolved an interstate dispute between New York State, New Jersey, Pennsylvania, Delaware, and New York City over the allocation of water in the Delaware River Basin.

The amended decree, which replaced an earlier 1931 decree, determined the amount of water that the city can take from its Delaware Basin reservoirs and the amount it must release downstream. The U.S. Geological Survey's (USGS) Office of the Delaware River Master was established to ensure that the provisions of the 1954 decree are met. The daily operations of the River Master's Office are conducted by Deputy River Master Gary Paulachok, who is located in Milford, Pa.

River Master Steve Blanchard paddled with Delaware River Sojourners on June 8, 2004 and gave a presentation about the decree and his office's duties during the lunchtime break. On September 22, 2004, DRBC commissioners and staff participated in a congressional briefing sponsored by USGS in Washington, D.C. to celebrate the decree's anniversary and its 50 years of cooperative water management in the basin. Additional information about the decree, including links to the Delaware River Master's web site, can be found at http://www.nj.gov/drbc/decree.htm.

Delaware Estuary News

- The Delaware Estuary Program (DELEP), one of 28 national estuary programs, was established in 1988 to lead public and private partners in the creation and implementation of the Comprehensive Conservation and Management Plan (CCMP) to protect and restore the estuary's natural resources. Over the past several years, the DELEP office, located at the DRBC's headquarters, worked closely with scientists and planners to facilitate interstate coordination and enhancement of the overall resource management capacity in the estuary while the private, non-profit Partnership for the Delaware Estuary, located in Wilmington, Del., focused on education and stewardship programs. Following the resignation of DELEP Director Peter Evans during the summer of 2004, the decision was made to merge the Partnership and DELEP into one entity under the leadership of Partnership Executive Director Kathy Klein, effective October 2004. The DRBC will continue to lead the scientific aspects of DELEP and in January 2005 hired Dr. Danielle Kreeger as estuary science coordinator to assess and compile estuary data and to serve as a liaison between DELEP and the commission.

- A two-part science conference was convened by the Partnership for the Delaware Estuary during 2005 to bring researchers, resource managers, the public, and other interested parties together to summarize the current state of science regarding the estuary and to build consensus in defining and prioritizing future science needs. "The State of Science in the Delaware Estuary" took place January 10-12 in Cape May, N.J. and was followed by "Linking Science and Management for the Delaware Estuary," which was geared toward the science needs of decision makers, on May 10-11, 2005 in Newark, Del.

- The Delaware Estuary Monitoring Report covering monitoring developments and data collected or reported during 1999-2003 was completed in September 2004. The report, which was prepared by DRBC Monitoring Coordinator Ed Santoro in cooperation with the commission's Monitoring Advisory Committee, can be viewed at http://www.nj.gov/drbc/04MonRpt/index.htm.

- Congressmen Frank LoBiondo (R-N.J.) and Michael Castle (R-Del.) along with Senators Jon Corzine (D-N.J.), Thomas Carper (D-Del.), Frank Lautenberg (D-N.J.), and Joseph Biden (D-Del.) secured $300,000 in federal funding for a Delaware Estuary oyster restoration project during 2004. Acting Governor Codey announced in February 2005 that New Jersey would contribute an additional $300,000 to the effort. The funds are being used to plant empty clam shells to spur the growth of oyster seed, which will then be transplanted at nursery sites in the Delaware Bay. This project will economically benefit the coastal communities in both New Jersey and Delaware and is an excellent example of the federal and state governments working together to leverage taxpayer dollars in support of a vital, shared natural resource. DRBC Deputy Director Bob Tudor has been actively involved in the oyster restoration efforts.

- New Jersey and Delaware in 2004 issued common fish consumption advisories for shared waters in the lower part of the Delaware

Estuary, including the bay and the Delaware River downstream of the Pennsylvania border, sending a consistent message to the public about what fish are suitable for eating and in what quantities. This is a great start to achieving common fish consumption advisories among the states throughout the estuary and is a key goal of the Delaware Estuary Program's CCMP.

Pennsylvania Act 220 Water Resources Planning

The DRBC received $250,000 in additional funding from Pennsylvania during both 2004 and 2005 to help the Commonwealth develop its new state water resources plan as required by Act 220. This funding would not have been possible without the strong support from a number of state senators and representatives as well as the DEP and Governor Rendell's office. Tasks include developing water demand analyses and inputs for watershed budgets, defining critical areas, and water conservation. DRBC staff helped to organize public meetings and hearings during May and August 2005 in Blue Bell and Hawley, Pa. to give residents of southeast and northeast Pennsylvania an opportunity to provide input into the development of the new state water plan. Both sessions were coordinated by the Delaware Water Resources Regional Committee, which is chaired by DRBC Executive Director Carol R. Collier. She also serves on the Statewide Water Resources Committee.

Interstate Flow Management Strategy Report Issued

A report summarizing flow management issues in the basin and recommending procedures and technical tools to resolve these types of issues was completed in August 2004. The "Strategy for Resolution of Interstate Flow Management Issues in the Delaware River Basin" was prepared for the commission by HydroLogics, Inc., in association with STV, Inc., ATS, Inc., the Greeley-Polhemus Group, and DRBC staff. The complete report can be viewed on the commission's web site at http://www.nj.gov/drbc/04flowreport/index.htm.

International Interest in the DRBC Continues

DRBC Executive Director Carol R. Collier had the opportunity to visit the People's Republic of China and Japan in 2004 as a member of a study group initiative that brought together several Chinese, U.S., and Japanese water experts to explore the potential for U.S.-Japan partnerships in promoting stronger river basin governance in China. The study tours and group research papers focused on river basin management institutions, financing, and public participation in the three nations. This project, "Crafting Japan-U.S. Water Partnerships: Promoting Sustainable River Basin Governance in China," was jointly initiated by the Woodrow Wilson International Center for Scholar's China Environment Forum (located in Washington, D.C.) and the Institute of Developing Economies (located in Chiba, Japan). Visit the DRBC web site at http://www.nj.gov/drbc/crc.htm to learn more about this tri-national river basin management project.

International visits to the DRBC's headquarters in West Trenton continued during 2004 and 2005 as commission staff welcomed a visitor from Australia as well as multiple delegations from China and South Korea. The last delegation visiting the DRBC in 2005 included officials from the National Capital Territory of Delhi, who wanted to learn about the commission's approach to water resources management to help them address the various issues facing 15 million people in India's Yamuna River Basin. The Yamuna flows into the Ganges River, which drains an area that is home to about eight percent of the world's population.

NPS Director Experiences the Delaware

National Park Service (NPS) Director Fran Mainella visited the Delaware River Basin over several days in late July 2005. Her first destination included the Upper Delaware Scenic and Recreational River, where she received an orientation to the

National Park Service Director Fran Mainella landing a smallmouth bass on the Delaware River below Damascus, Pa. Joining her in the kayak is outdoor writer/editor Ken Schultz and in the background is NPS Resource Specialist Don Hamilton. (Photo courtesy of Sandra Schultz/NPS)

park, paddled the river, caught a few fish, and attended RiverFest in Narrowsburg, N.Y. During her day-long visit to the Delaware Water Gap National Recreation Area (DWGNRA) on July 25, she toured the park and participated in the 16th Annual "On and Under the Delaware River Cleanup" sponsored by Kittatinny Canoes. Kittatinny proprietor Ruth Jones and hundreds of volunteers over the years have removed nearly 250 tons of trash and thousands of tires from the river.

"This is my first time on the Delaware, and it looks like a lot of fun," Mainella said in a *Sullivan County Democrat* article. "I am so impressed [with] what is being done around this area. You have so many groups working together to ensure the beauty of the Delaware River as well as its surrounding communities. The Delaware River has so much to offer, and working together like everyone is, I know the river's future is well protected."

Mainella is the 16th director and the first woman to lead the National Park Service. According to published reports, she is the first NPS director to visit the DWGNRA, which celebrated its 40th anniversary on September 1, 2005.

A Whale of a Tale

For about a week during April 2005, hundreds of onlookers flocked to the banks of the Delaware River to catch a view of a wayward, white beluga whale that was sighted as far upstream as Trenton, N.J. Noticing an old healed scar on the back of the whale, researchers identified the out-of-place, cold-water mammal as a male named Helis (pronounced "ay'-LEE," derived from the French word for propeller, helice, the suspected cause of his scar). Helis, first sighted as an adult in 1986 in the St. Lawrence River, was seen regularly until 1994, but then only twice in 2000 and 2003 before his unexpected trip to the Delaware. Experts said the whale, estimated to be 10 to 12 feet long, appeared to be in good health despite being about 1,200 miles away from his home somewhere between the St. Lawrence River and the Arctic Circle. One theory was that Helis swam up the Delaware enjoying meals of shad, which also were swimming upstream during spawning runs taking place at that time of the year. The U.S. Coast Guard and N.J. State Police carefully watched the whale, protected by federal law, to make sure boaters and others left it alone as it eventually made its way back to the Delaware Bay and out into the Atlantic Ocean.

Helis, the beluga whale, in the Delaware River near Burlington, N.J. (Photo courtesy of NOAA/U. S. Dept. of Commerce)

DRBC Awards

- The commission was presented a first place "Blue Pencil" award by the National Association of Government Communicators for its bald eagle and shad bookmarks in May 2004.

- DRBC's *Water Resources Plan for the Delaware River Basin: A Common Vision for a Common Resource,* published in September 2004, received the Elwood "Woody" Jarmar Award for Outstanding Environmental Achievement by the New Jersey Chapter of the American Planning Association in 2005.

- The commission's Pollutant Minimization Plan (PMP) rule, approved in May 2005 to reduce levels of toxic chemicals in the water column and fish of the Delaware Estuary, received an Honorable Mention in the Clean and Plentiful Water category at New Jersey DEP's Annual Environmental Excellence Awards Program in November 2005.

Project Application Status Web Page

A new page was added to the DRBC's web site in December 2005 to assist applicants and the public in understanding the status of docket and permit applications. In addition to general information about the commission's project review authority, a matrix is provided containing information about applications that are currently under review. The page, which is updated monthly, can be viewed at http://www.nj.gov/drbc/dockets/status.htm.

Financial Summary:
Cumulative Federal Shortfall Expected to Top $6 Million

The commissioners on January 19, 2005 unanimously adopted the DRBC's $4.97 million annual General Fund operating budget for fiscal year (FY) 2006, which extends from July 1, 2005 through June 30, 2006. The federal Energy and Water Development Appropriations Act (P.L. 104-206) eliminated U.S. funding support of the DRBC's annual operating budget beginning in October 1996. Federal funding has not resumed since that time and the resulting cumulative shortfall is projected to grow to $6.4 million by the end of FY 2006.

For the second consecutive year, the budget adopted in January 2005 put in place a mechanism for program and service reductions if the five commission members do not fully contribute their fair share of the annual budget. The FY 2006 budget calls for no increase in the signatory funding levels that have been in place since FY 2002, despite the rising costs of delivering services over the past four years. This underscores the urgent need for the federal government and the four basin states to fully pay their fair share contributions.

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.

Delaware River Basin Commission Fiscal Summary - Agencywide		
	FY04	FY05
Revenues:		
Signatory Contributions	$2,601,000	$2,643,000
Grants & Special Projects	2,364,903	2,677,309
Surface Water Supply Charges	2,320,097	2,356,251
Project Review Fees, Investment Income & Other	1,019,437	1,174,801
Expenses:		
Salaries & Benefits	$3,543,840	$3,227,590
Operating Expenses	2,717,152	3,090,871
Debt Service and Depreciation	1,521,188	1,246,424
Building Improvements/Equipment Acquisition	410,524	58,571

"Since most of the DRBC's [General Fund] expenses are personnel-related, programs have directly suffered by our cuts this [2005] fiscal year. We had to temporarily suspend our Flood Advisory Committee and its important flood loss reduction efforts on July 1, 2004 shortly before we witnessed the worst main stem river flooding since 1955 in September. In addition, we were forced to cut back on monitoring activities in New Jersey and Pennsylvania tidal tributaries and in November 2004 we found ourselves facing a major oil spill in the Delaware where having that lost information could have proved very useful. The basin community would have been better served had these reductions not been necessary."

– DRBC Executive Director Carol R. Collier, February 2005


Delaware River Basin
New York
Pennsylvania
New Jersey
Maryland
Delaware
SCHOHARIE COUNTY
CHENANGO COUNTY
GREENE COUNTY
BROOME COUNTY
DELAWARE COUNTY
SULLIVAN COUNTY
WAYNE COUNTY
ULSTER COUNTY
ORANGE COUNTY
LACKAWANNA COUNTY
PIKE COUNTY
LUZERNE COUNTY
MONROE COUNTY
SUSSEX COUNTY
WARREN COUNTY
MORRIS COUNTY
CARBON COUNTY
NORTHAMPTON COUNTY
LEHIGH COUNTY
SCHUYLKILL COUNTY
HUNTERDON COUNTY
BERKS COUNTY
LEBANON COUNTY
BUCKS COUNTY
MERCER COUNTY
MONTGOMERY COUNTY
CHESTER COUNTY
LANCASTER COUNTY
MONMOUTH COUNTY
PHILADELPHIA COUNTY
CAMDEN COUNTY
BURLINGTON COUNTY
OCEAN COUNTY
GLOUCESTER COUNTY
ATLANTIC COUNTY
SALEM COUNTY
NEW CASTLE COUNTY
CUMBERLAND COUNTY
CAPE MAY COUNTY
KENT COUNTY
SUSSEX COUNTY
Cannonsville Reservoir
Pepacton Reservoir
Neversink Reservoir
Rondout Reservoir
Jadwin Reservoir
Prompton Reservoir
Lake Wallenpaupack
F.E. Walter Reservoir
Beltzville Reservoir
Still Creek Reservoir
Blue Marsh Reservoir
Ontelaunee Reservoir
Nockamixon Reservoir
Merrill Creek Reservoir
Marsh Creek Reservoir
Deposit
Hancock
Narrowsburg
Port Jervis
Milford
Montague
Delaware Water Gap
Easton
Phillipsburg
Allentown
Bethlehem
Reading
Pottstown
Trenton
Philadelphia
Camden
Wilmington
Salem
Dover
Cape May
Lewes
New York City
Delaware River
West Branch Delaware River
Little Delaware River
East Branch Delaware River
Beaver Kill
West Delaware Tunnel
East Delaware Tunnel
Willowemoc Creek
Equinunk Cr.
Callicoon Creek
Lackawaxen River
Mongaup River
Neversink River
Rocher Kill
Delaware Tunnel
Tobyhanna Creek
Broadhead Creek
Bushkill Creek
Flat Brook
Paulins Kill
Pequest River
Pohatcong Creek
Musconetcong River
Black Creek
Pohopoco Creek
McMichael Creek
Aquashicola Creek
Schuylkill River
Little Schuylkill River
Jordan Creek
Lehigh River
Monocacy Creek
Little Lehigh Creek
Tohickon Creek
Tulpehocken Creek
Perkiomen Creek
E. Br. Perkiomen Creek
Neshaminy Creek
Assunpink Creek
Wissahickon Creek
Brandywine Creek
West Branch
White Clay Creek
Christina River
Chesapeake & Delaware Canal
Pennsauken Creek
Rancocas Creek
North Branch
Big Timber Creek
Cooper River
Blacks Creek
Cohansey River
Maurice River
Salem River
Oldmans Creek
Raccoon Creek
Mantua Creek
Stowe Creek
Alloway Creek
Smyrna River
Leipsic River
St. Jones River
Murderkill River
Mispillion River
Cedar Cr.
Dennis Creek
Delaware Bay
Atlantic Ocean
Chesapeake Bay
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Miles
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