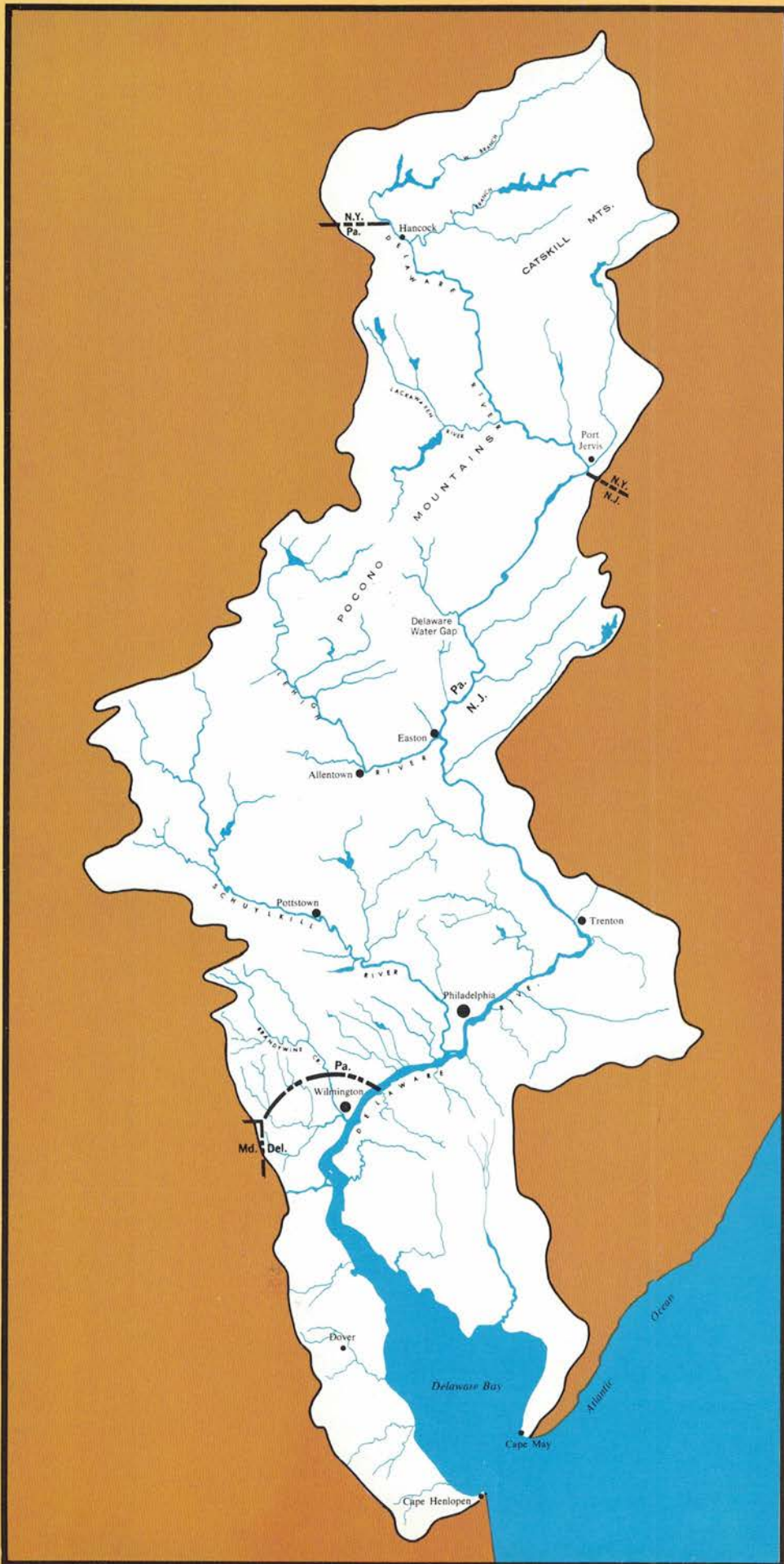


Whereas the signatory parties recognize the water and related resources of the Delaware River Basin as regional asset vested with local, State, and National interests, for which they have a joint responsibility; and

Whereas the conservation, utilization, development, management, and control of the water and related resources of the Delaware River Basin under a comprehensive multipurpose plan will bring the greatest benefits and produce the most efficient service in the public welfare; and

Whereas such a comprehensive plan administered by a basin-wide agency will provide effective flood damage reduction, conservation and development of ground and surface water supply for municipal, industrial, and agricultural uses; development of recreational facilities in relation to reservoirs, lakes, and streams; propagation of fish and game; promotion of related forestry, soil conservation, and watershed projects; protection and aid to fisheries dependent upon water resources; development of hydroelectric power potentialities; improved navigation; control of the movement of salt water; abatement and control of stream pollution; and regulation of stream flows toward the attainment of these goals; and

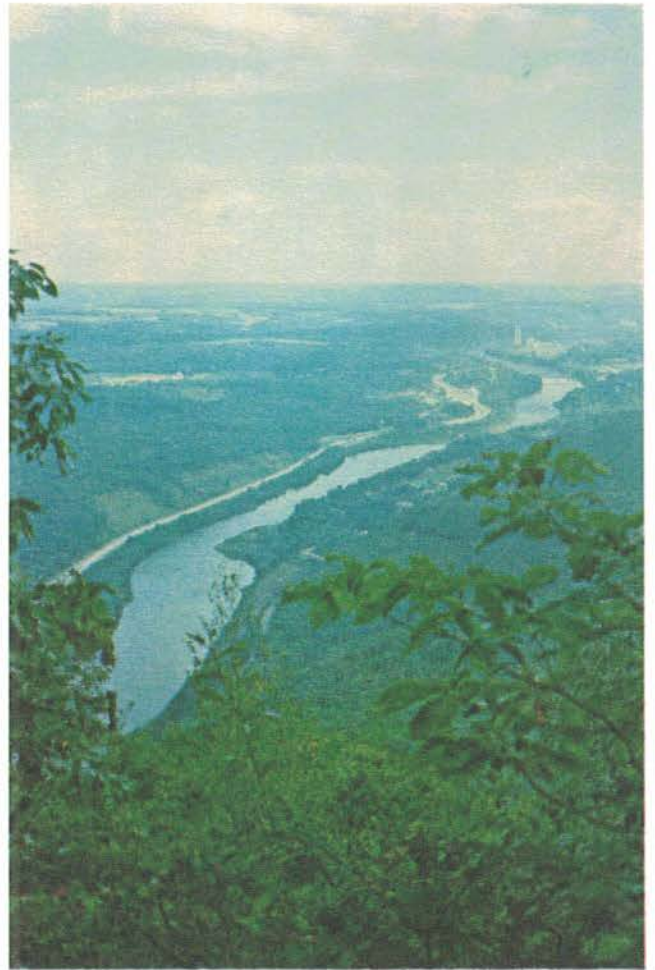
Whereas some twenty-two million people of the United States at present live and work in the region of the Delaware River Basin and its environs, and the government, employment, industry, and economic development of the entire region and the health, safety, and general welfare of its population are and will continue to be vitally affected by the use, conservation, management, and control of the water and related resources of the Delaware River Basin; and



The Delaware River Basin

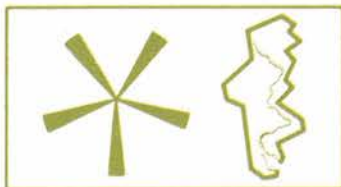
Reproduced on the cover are sections from the preamble of the Delaware River Basin Compact.

This is the view of the Delaware River looking downstream from crest of Pennsylvania side of the Water Gap.



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Governor Peterson



Governor Shapp

Chairman
Russell W. Peterson
Governor of Delaware

Vice Chairman
Milton J. Shapp
Governor of Pennsylvania

William T. Cahill
Governor of New Jersey

Nelson A. Rockefeller
Governor of New York

Rogers C. B. Morton
Secretary of the Interior

U. S. Member appointed by the President
Governors serve ex officio

The Commission

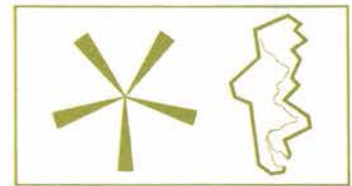
Governor Cahill



Governor Rockefeller



Secretary Morton



Harold L. Jacobs
Delaware
Maurice K. Goddard
Pennsylvania
Richard J. Sullivan
New Jersey
W. Mason Lawrence
New York
Paul M. VanWegen
United States



Mr. VanWegen



Dr. Lawrence



Mr. Sullivan

Alternate Members

Dr. Goddard



Mr. Jacobs



Advisors

Martin Lang
New York
Samuel S. Baxter
Pennsylvania
Col. Carroll D. Strider
United States



The toll bridge crossing Delaware at Dingman's Ferry, from Pennsylvania side. Area would be inundated by Tocks Island reservoir.

Introduction

This is the ninth annual report of the Delaware River Basin Commission to be presented to the people of the valley and to their state legislators in New York, New Jersey, Pennsylvania and Delaware and elected representatives in the United States government. It covers the year ending June 30, 1971.

The period was marked especially by responses to public concern over negative impact on the environment from society's efforts to keep pace with the times, including population and industrial growth. Such efforts inevitably draw upon natural resources.

It was the intent of the interstate-federal Delaware River Basin Compact that the organization it created manage the region's water-related resources in the public's interest to meet its needs and, at the same time, conserve and protect environmental values so they can be enjoyed and used by future generations. The report describes the policies, activities and progress toward those goals.

The basin's water pollution control program continued to bear fruit as dischargers by the dozens improved the purification of their wastes and as additional dozens were brought under

abatement orders to comply soon with the Commission's stream and effluent requirements. Also, municipalities and industries joined regional treatment systems in larger numbers, and efforts were begun to more effectively restrict toxic wastes.

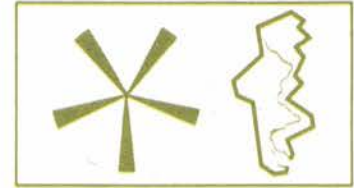
Accommodation of future water supply needs was a big part of the valley's picture this year, along with completion of the basin's first major multi-purpose reservoir and advancements on several others, and widening of the Commission's project review activities and responsibilities.

Expansion of the basin's system of larger flood control structures that mainly protect big streams continues. Yet devastation continues to strike unpredictably in smaller tributary watersheds that are in serious need of more concentrated action, especially local land use controls.

It is gratifying that two of the Compact's signatories, New York and Pennsylvania, joined this year with Maryland and the United States in establishing the new Susquehanna River Basin Commission and moreover that they patterned it largely after the Delaware River experience.

The Year in Review

Water supply and quality gains made as ecology concerns are stressed



Technology vs. environment.

This, one of the spirited and usually oversimplified issues in the age of polarized attitudes, has plunged the Delaware River Basin Commission more than ever in the role of the referee, of the conciliator.

The Delaware River Basin Compact commits the Commission to a course that accommodates the people and nature alike — that puts both on the same side. Reasonable middle ground remains the goal, as it was five years ago when the Commission selected water quality standards that are practical of attainment but which were opposed as too stringent by industrial and municipal waste dischargers and too lenient by sportsmen.

It is the Compact's principle and the Commission's policy to help assure that the community of 25 million persons has adequate and clean water supplies, flood protection, recreation for leisure time, uninterrupted electrical power and reasonable means of disposing of liquid wastes.

Meanwhile, DRBC must adequately protect ground and surface waters against depletion and wetlands against encroachments that could disrupt one of nature's basic life cycles, as it must assure good fisheries and be the instrument to enforce society's anti-pollution insistence.

To facilitate its continued ability to mediate these competing water uses, the Commission this year solicited outside counsel from a leading academic institution on the effectiveness of its policies and programs, particularly in the light of the policies of the National Environmental Policy Act of 1969. The resulting recommendations are under consideration and some already are moving toward implementation.

Also, the Commission added to its rules and comprehensive plan new sections to broaden its environmental protection sights and to apply throughout the basin the requirements of the new federal law on the many issues that lie ahead, such as difficult decisions on applications for approval of a pair of nuclear electrical generating stations.

Water Supply

Because of completion of Beltzville reservoir and other action taken this year, the Commission can start delivering more water supplies to the valley's growing residential and industrial community by next year.

Planning progressed on a pump-and-pipeline installation on the Delaware to meet the heavy domestic and industrial water requirements in Bucks and Montgomery Counties in Pennsylvania. The new reservoir will help provide the water. These and other customers for new water will be served under guidelines that were adopted by the Commission in 1971 for allocating and selling the supplies.

Pollution Control

By year-end, more than 90 percent of the allocated organic wasteload to the 86-mile estuary below Trenton had been brought under abatement schedules in a phase of the Commission's pollution control program that began in 1969. The Commission still looks to perceptible improvement in the estuary's low-oxygen problem by the mid-1970s, with some indicators looking up already. A newer program of extending abatement schedules to the non-tidal Delaware upstream of Trenton got under way this year with approval of four cleanup timetables, including two for dischargers in New York State.

(A list of dischargers placed under abatement orders in 1971 appears on page 18.)

The Commission's attentions were concentrated this year also on two other big anti-pollution goals. One is to reduce substantially the volume of metals and other inorganic contaminants being dumped into Delaware streams, while the other will increase sharply the number of systems for regional collection and treatment of wastes in heavily developed subregions of the basin, thus better providing local pure water sources for domestic use, recreation and so on.



Mr. Kilborne



Mr. Lang



Col. Strider

Good Year — Then Floods

Hydrologically, July 1970 to June 1971 was a good, if uneventful, year for the valley, and a lucky one compared to the previous year and the months that followed.

The most tragic Delaware Basin flooding since the valley's disastrous and record torrents of 1955 struck twice within three weeks in August and in September 1971, this time in New Jersey and the Philadelphia area when flash crests on tributary streams took 18 lives.

In both instances, the main trunk of the Delaware was spared — by tropical storms that skirted the valley — as it had been twice in 1969-70. Local flash flooding had resulted in disaster declarations for several upper basin counties of Pennsylvania and New York in August 1969, and the main stem had another close call after the spring thaw in 1970.

Project Reviews

Plans for 227 projects sponsored by public agencies and commercial and other private organizations were submitted to the Commission for review to insure against harmful effects on water resources. During the year, 83 public facilities, nearly all water supply and waste treatment works, were added to the basin's comprehensive plan, while 100 proposals, including piers, dikes and docks and industrial waste facilities also were cleared.

Tocks Island

The Tocks Island project, a multi-purpose reservoir that includes a surrounding National Recreation Area, came under bitter attack from environmental groups this year. But it continued to win approval in the Congress, which for the second consecutive year set aside funds to start building.

Meanwhile, construction must await the results of a massive review to determine the environmental effects of the project and if they will be harmful. This involves the drafting, solicitation of outside comments on, then redrafting impact statements on the reservoir, park and hydropower phases of the program by the Corps of Engineers, National Park Service, Delaware Basin Commission and a group of private electric utilities. The environmental investigations were well under way as the year closed.

Reorganization

The Chairman's gavel passed from Governor Cahill of New Jersey to Governor Peterson of Delaware at the 1971 annual meeting at Dover, Del. Gov. Shapp of Pennsylvania and Secretary of the Interior Morton attended their first meeting as Basin Commissioners. Gov. Shapp is the new Vice Chairman.

Dr. W. Mason Lawrence, Deputy Commissioner for Environmental Management in New York's Department of Environmental Conservation, and an official long familiar with Delaware water matters, became his state's Alternate Commissioner, succeeding R. Stewart Kilborne, former Conservation Commissioner.

New York City's Commissioner of Water Resources, Martin Lang, took over from Maurice M. Feldman as Advisor to the New York member, and Col. Carroll D. Strider, the Army Corps' new Philadelphia District Engineer, succeeded Brig. Gen. James A. Johnson as Federal Advisor.

Administration

Construction of the Commission's new 27,000 square-foot headquarters building at 25 State Police Drive in West Trenton, was completed in December 1970 at a cost of \$993,000. The building was occupied immediately, bringing the entire staff under one roof for the first time in more than three years.

The administrative budget supporting the 10 planning programs totaled \$1,360,000 for fiscal 1971. Approximately \$32,100 in budgeted funds, including federal grant moneys, was not received, leaving a net appropriation of \$1,327,900, of which \$225 was unspent.

Cost of special programs financed outside regular appropriation channels not included in the regular budget included \$456,377 for the Salem-Gloucester regional waste study, financed by industry contributions and a federal grant of \$646,700; and \$7,429, secured from an electric utility group, for the Tocks Island fish research study.

Audits of the Commission's financial records were completed by a private, independent accounting firm. Also audited were the finished Lambertville-New Hope wing dam project and the Commission's social security records and accounts.

Four vacancies that developed in 1970-71 in the authorized complement of 53 employees remained unfilled through the end of the fiscal year to offset revenue shortages.

New headquarters of DRBC at West Trenton.



The Staff



Mr. Wright



Mr. Peeck, Mr. Whitall, Dr. Miller, Mr. Thompson



James F. Wright	<i>Executive Director</i>
William Miller	<i>General Counsel</i>
W. Brinton Whitall	<i>Secretary</i>
Dawes Thompson	<i>Public Information Officer</i>
Arthur E. Peck	<i>Chief Administrative Officer</i>

Planning Division



Mr. Howlett



Mr. Thursby, Dr. Hull, Mr. Macauley, Mr. Craighead

Mr. Selzer, Mr. Briganti, Mr. Goodell, Mr. Porges



Herbert A. Howlett	<i>Chief Engineer</i>
J. W. Thursby	<i>Staff Economist</i>
C. H. J. Hull	<i>Staff Engineer</i>
William M. Craighead	<i>Staff Biologist</i>
Clinton Macauley	<i>Program Control Officer</i>

BRANCH HEADS

Ralph Porges	<i>Water Quality</i>
Robert L. Goodell	<i>Operations</i>
Theodore Briganti	<i>Project Review</i>
Seymour D. Selzer	<i>Program Planning</i>

Water Supply

New stores ready for users; pricing guide is adopted

This was the biggest year to date in the basinwide program to harness and administer the river's resources to meet the region's vastly expanding water supply demands.

These were the principal developments:

- *Beltzville, the largest reservoir yet built to serve the water needs of the Delaware Basin, was completed.*
- *The Basin Commission enacted a broad policy under which users will be allocated and charged for water from Beltzville and other federally-constructed reservoirs.*
- *A large intra-basin diversion plan was authorized that will deliver water from the Delaware to serve users in the northern Philadelphia suburbs of Bucks and Montgomery Counties.*

The 1970 population of the combined Delaware Basin and its service area, which includes Northeast New Jersey and New York City, totaled 25 million persons and is forecast to grow to some 40 million by the year 2020. Meanwhile, water use will double. To keep pace with this great demand as it develops, a network of more than a dozen reservoirs, including many state facilities, has been planned and incorporated into the Basin Commission's Comprehensive Plan.

In 1964, the Basin Commission agreed to reimburse the United States the cost of installing water supply storage space in a series of eight authorized federal reservoirs. The Commission thus assumed control of the management and disposition of the reservoirs' water supply.

Since federal law requires that "local interests" must finance such water supply features, a formal policy was adopted under which the annual repayment obligation is to be met by the Commission, acting in behalf of the states, which would put up money as general beneficiaries to the extent that the cost is not covered by funds from direct sales to water-using communities and industries.

For seven years, Pennsylvania and New Jersey have been building up an escrow fund toward payments that will be made to finance the pooled water supply in three federal reservoirs — Beltzville, located in the Lehigh Valley; Blue Marsh, a future Schuylkill River impoundment, and Tocks Island, to be built on the Delaware River near the Water Gap. As water sales increase, state obligations will be reduced or ultimately eliminated.

Pricing Policy

The readiness of Beltzville Reservoir to deliver water necessitated a pricing policy, adopted by the Basin Commission at its 1971 annual meeting, paving the way for the Commission to negotiate contracts for sale of water to users.

The policy assigned to the Commission responsibility for managing the basin's waters as a "unitary system" and establishing uniform schedules of rates and charges for surface waters "used, withdrawn or diverted."

The policy also established the guidelines for determining rates to be charged. Generally, the Commission is to recover from users and the benefiting states sufficient annual revenue to cover all project costs, including debt service, operation, maintenance, replacement, reserves and administration. Charges will be levied for water taken only in amounts exceeding that used prior to April 1971. A weighted-average unit cost of water stored by the Commission in all reservoirs will be charged to public or private users alike. Reduced rates may be allowed for cooling water that is returned to the streams unimpaired in quantity and quality, and surcharges may be added for consumptive uses (evaporated or otherwise permanently lost to the streamflows) and out-of-basin diversions.

Supplies for Philadelphia Suburbs

The biggest future water supply demand area within the Delaware Basin, and exceeded in the Delaware's service area only by Northeast Jersey, is Bucks and Montgomery Counties to the north of Philadelphia.

Keeping abreast of the area's growth, Bucks County has progressed with development of a water storage program in the upper Neshaminy Creek, but must reach outside this watershed to the main stem of the Delaware, a short distance upstream of New Hope, for ample supplies to distribute through the system.

The Commission in the mid-1960s had authorized in its comprehensive plan the Bucks water development, which would serve also the North Penn and North Wales sections of Montgomery County. But, meanwhile, water demand projections expanded further due to increased suburban development, need for low-flow augmentation for water quality control, and a newly-planned nuclear electric generating plant on the Schuylkill River near Pottstown that would require large volumes of cooling water.

Latest figures show that domestic needs for Delaware water to serve the area are up to 50 million gallons a day at first, doubling in 25 years, plus up to 42 million for the power plant.

Bucks returned to the Commission this year for an amended authorization to accommodate the expanded scheme, entailing a pumping station on the Delaware larger than planned earlier and also two short pipelines to the headwaters of Neshaminy and Perkiomen Creeks. The Commission granted the authorization, but at year-end a decision still was pending on designating responsibility for financing, constructing and running the system.

Floods: 1971

Back-to-back storms strike lower basin; death toll is 18

Flood devastation to human life and property has struck again in the Delaware River Basin — this time in the Philadelphia metropolitan area, and mostly along inadequately protected tributary streams.

Fourteen persons perished in Delaware, Chester and Montgomery Counties and thousands of homes were ravished and families made homeless by unprecedented heavy rains that fell between September 10 and 14, 1971 from freak weather conditions involving tropical storm Heidi. Nearby New Jersey and Delaware counties were also hit. This followed by less than three weeks a similar storm-flood combination that took four lives as it victimized many New Jersey communities within the Delaware Valley from Trenton south. It caused the worst flood ever on Assunpink Creek.

Hardest hit were Norristown and the City of Chester, where five persons died after 12.3 inches of rainfall, more than a quarter of a normal full year's precipitation.

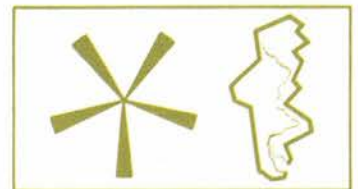
Both recent flood events, whose incomplete property damage estimates exceeded \$36 million, many times the whole basin's yearly average, actually occurred following the 1970-71 year covered by the remainder of this report, a period of hydrologic normalcy, but one that also was preceded by extensive but non-fatal floods in northern parts of the basin.

Luckily, the still undefended main stem of the Delaware River escaped the effects of both storms. This was largely due to the paths of the tropical storms moving away from the Delaware as they headed north, thus sparing the upper basin from torrential rains. Otherwise, the main river could have suffered another disaster like the record flood of 1955, since the river remains vulnerable in the continued absence of an on-Delaware impoundment.

The new Beltzville reservoir would have teamed with the older Francis Walter dam to prevent recurrence of the extensive 1955 damage to Allentown, Bethlehem, Easton and other Lehigh River communities. But the Schuylkill River, like the Delaware, remains largely unprotected from a 1955-like flood. The Schuylkill and Lehigh are the Delaware's biggest tributaries.

Flood control dams are planned but still unbuilt in many of the stricken Philadelphia-area watersheds, including hard-hit Chester Creek. Yet had it not been for the existence of one new flood dam upstream of Norristown, the \$2.5 million property damage there might have been even greater.

Likewise, zoning to prevent such human hardship by banning incompatible developments on flood plains, a local government option, is an anti-flooding device that remains unused in all but a few municipalities.

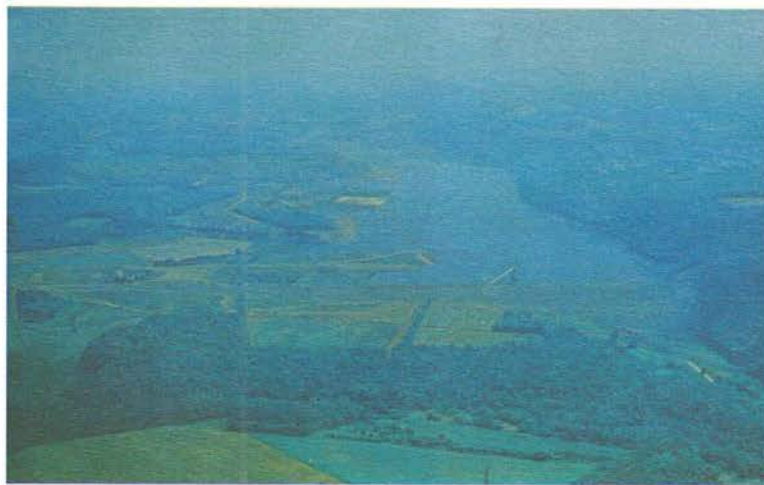


Scenes in (l. to r.) Lambertville, Trenton and Chester areas during or after floods of late-Summer 1971.



Reservoirs

Beltzville on the line; effects of Tocks Island are investigated



The completed Beltzville reservoir in the Lehigh Valley.

The first major multi-purpose project ever built in the four-state Delaware River Basin, Beltzville on a Lehigh River tributary, went into operation this year.

The Federal Government's even larger Tocks Island lake and park project on the Delaware main stem near the Water Gap meanwhile was readied for construction with funds that have been earmarked by Congress. But the work cannot commence until it clears perhaps the most intensive and exhaustive environmental impact investigation ever conducted on an American public works project.

Each of these facilities is part of the Basin Commission's master plan for long-range development to provide unified control, protection and use of the valley's water-related resources, as are many other installations on which land acquisition and planning work by the states, counties, local communities and the Federal Government progressed this year.

Among these are Evansburg reservoir in Montgomery County, Blue Marsh in the Schuylkill Valley, Trexler in the Lehigh watershed, all Pennsylvania, Hackettstown lake on the Musconetcong River in Northwest Jersey, and many smaller local watershed protection programs in both states.

The Commonwealth of Pennsylvania approached completion of two Delaware tributary reservoirs earmarked for immediate recreation and future water supply use. They are on Tohickon Creek, a Delaware River feeder in upper Bucks County, and Marsh Creek, a Brandywine Creek tributary where Chester County and the U.S. Soil Conservation Service are cooperating in the job.

Beltzville

The Beltzville project will deliver to the Lehigh Valley a package of diverse benefits — more protection from the perennial flooding plague for both people and property downstream, particularly in the built-up Allentown-to-Easton reach; vital supplies of water for local use; a beautiful Pocono Mountain lake-based state park; and more fresh water to help improve the quality of water in the lower Lehigh.

Water supply from the project also will go to downstream users in the Philadelphia suburbs and New Jersey and contribute to assuring a desirable inflow to the estuary at Trenton to control salinity and pollution in the lower river.

Beltzville is the first of the major impoundments to be started and completed since adoption nine years ago of the valley's master plan.

Tocks Island

For the Tocks Island Reservoir, its companion Delaware Water Gap National Recreation Area and the related Kittatinny Mountain private pumped storage electrical generating proposal, this was the year in which scattered if intense local opposition escalated into a nationwide conservation controversy.

This appeared to result from the long-delayed project becoming ready to enter construction in the immediate wake of newly enacted national policies aimed at minimizing harm to the natural environment.

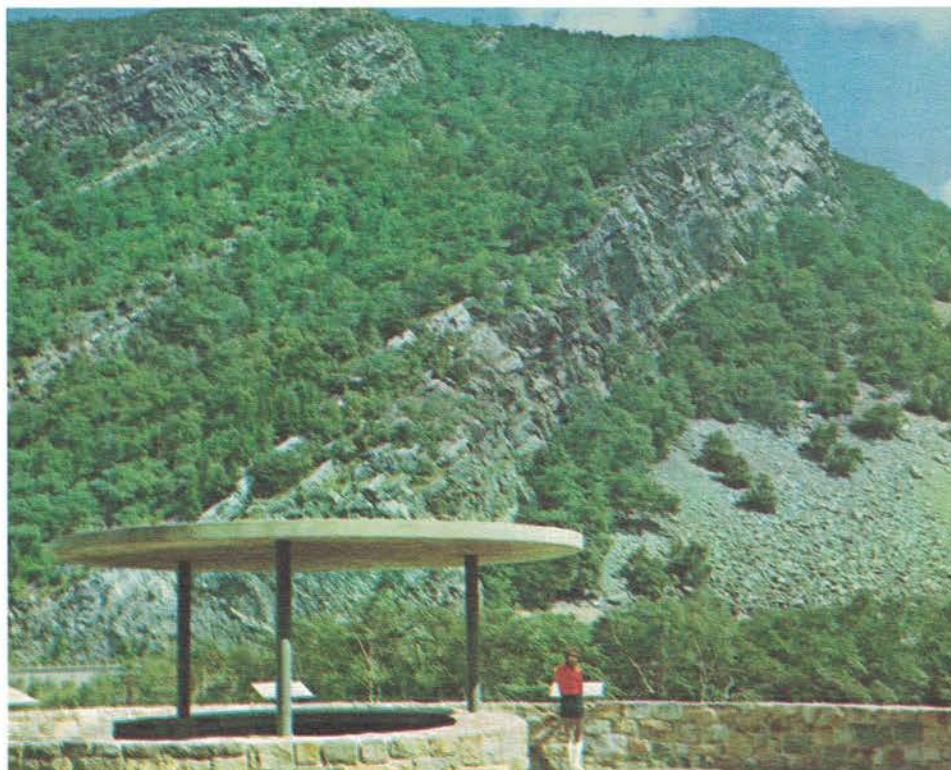
Critics argued for abandonment of the reservoir plan and a search for alternative means of producing the benefits for which it was designed. They insisted that the massive development would reap undesirable change on the upper valley and that the free-flowing character of the river should remain undisturbed. They contended that the lake would be ringed by mudflats, become eutrophic and produce a poor fish crop.

Sponsors and supporters countered that the project will help preserve rather than ruin the area's natural character, that the feared conditions would be prevented or held to minimum levels and that a good fishery management program would produce and sustain one of the best angler attractions in the Northeast. They defended the program as having no reasonable physical or economic alternative available to produce the planned recreation, flood protection, water supply and economical power benefits.

As the year ended, extensive environmental studies were being conducted into these rival contentions by government agencies under guidance from the White House's Council on Environmental Quality.

An assault on the Tocks project by critics who sought to halt the flow of construction funds was rejected by the Congress in 1971. Instead, it added \$1 million to the \$8.55 million requested in the President's budget, nearly half of it construction funds that cannot be spent pending the environmental investigation. If cleared, construction could begin by mid-1972.

View toward New Jersey within Delaware Water Gap as seen from Park Service lookout in National Recreation Area.



Environment

**Scope of DRBC rules widened;
new emphasis urged by U. of P.**

An outside review that was conducted this year into the Commission's powers and activities produced a series of broad environmental recommendations that are now under consideration.

The Commission engaged the University of Pennsylvania's Environmental Studies Institute to make the study in light of new demands arising since the agency's creation nearly a decade ago, particularly in the National Environmental Policy Act of 1969.

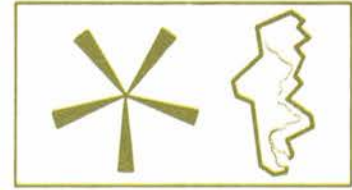
The staff already has moved to begin implementing some of the recommendations. Funds have been included in next year's suggested budget to set up a four-member unit to specialize in environmental work, such as preparation and review of impact statements in compliance with the 1969 federal law, and to step up the Commission's flood loss reduction program.

The Institute critically reviewed the adequacy of the Commission's programs, especially those relating to controls over water-related land use, preservation of natural and scenic areas, and water use allocation policies.

In so doing, it called for a "very high priority" program to protect flood plains, marshes and other wetlands, suggested "value studies" leading to protection of natural, historic and scenic areas from encroachments, and urged adoption of basinwide policies to allocate water for use, consumption and waste assimilation in a manner that influences the pattern of regional growth.

Clarification of the Commission's jurisdiction to allocate ground waters similar to its powers over surface resources should be pursued, the report declared, as should a clearer division of responsibility between the Commission and states in water pollution enforcement.

The Commission was advised to seek increased appropriations from the federal and state



governments to extend control over more programs and to secure more grants to finance research, including a study into the merits of setting up a system of imposing effluent charges against dischargers who thus would share pollution cleanup costs in proportion to their contribution to the problem.

It also should collect fees to help pay for pollution monitoring and surveillance, reviewing projects, environmental statements and other services and functions, the report said. Summary abatement procedures should be instituted to deal with pollution spills and other emergencies.

Appointment of an ombudsman and earlier notice to the public on some matters were among suggestions dealing with hearing procedures. Organizational changes were urged to bolster information, planning, legal and pollution enforcement functions, and a broad-based citizens advisory committee was advocated to give water users a regular forum with the Commission.

New Requirements

Conforming with the new National Environmental Act, the Basin Commission adopted a broad set of rules requiring sponsors of all water-related projects to supply in advance full details on their environmental effects and imposing on the staff broadened project review responsibilities.

Sponsors must now provide a general statement of ecological impact including unavoidable negative effects, descriptions of possible alternatives, data relating to long-term productivity versus short-term use of natural resources, and disclosure of any irreversible changes to nature that would result.

Covered by the Commission's new regulations are reservoirs of more than 100 million gallons, inter-watershed transfers of more than one million gallons daily, power lines or highways traversing projects or areas in the Commission's comprehensive

plan, wetland or marsh fill operations involving more than 25 acres, and dredging and other stream clearance activities.

A major intent of the new rules, as with the Federal Council on Environmental Quality requirements, is maximum public disclosure of negative conservation prospects, including pollution.

The Basin Commission further expanded its environmental protection jurisdiction by providing that projects now will be investigated not only in accordance with the Commission's own and federal environmental standards but also those of the four signatory states, even where the requirements go beyond direct effects on water resources.

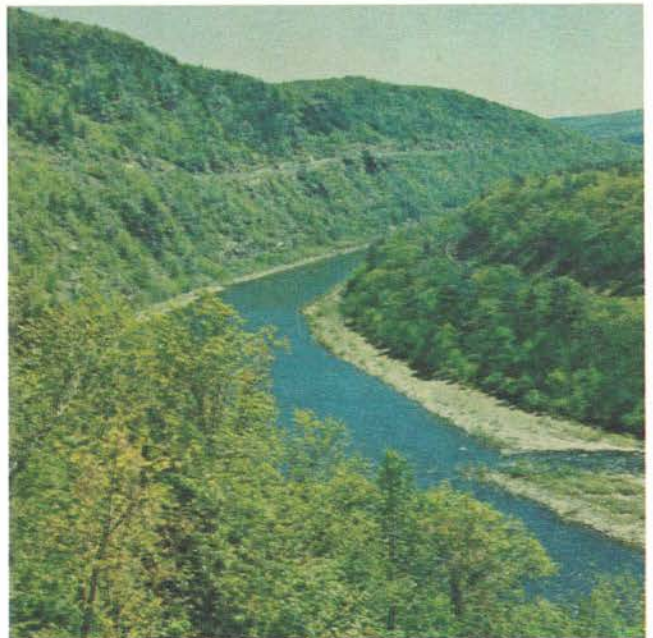
With establishment this year of the Department of Environmental Resources by the Commonwealth of Pennsylvania, all four Delaware Basin states have now consolidated their resource-related operations into new agencies in response to present-day environmental demands.

Honey Hollow

Even before receiving the University of Pennsylvania's recommendations, the Basin Commission this year took into account historic values and land use considerations to resolve a controversy over an electric utility company's plan to run a high voltage transmission line through the Honey Hollow Watershed in Bucks County, Pa.

As the first small watershed in the country to enjoy protection under a then new soil conservation law 30 years ago, the area had been designated a National Historic Landmark. The residents protested that the power line plan would degrade its character and historic standing.

The Basin Commission interceded and ruled that the line must be installed along a route skirting the watershed area in an action that pleased conservationists.



Proposed as a National Scenic River is upper section of the Delaware, including this reach between Port Jervis and Barryville, N.Y.

The Bay

The long-range goal of protecting the water and related land resources of the comparatively unspoiled bistate Delaware Bay region had a big year.

Governor Peterson and the Delaware Legislature both imposed bans on industrial development on the west shore, while the University of Delaware's Marine Studies College initiated work on a Delaware Bay information atlas that will help provide the basis of a future management and protection program. A grant received by DRBC from the U.S. Office of Sea Grant Programs was combined with funds secured from the National Geographic Society by the college to support the information atlas project.

Meanwhile, Governor Cahill of New Jersey established a Delaware River and Bay Council to pursue a protection program on that side of the Bay.

Scenic River

In a conservation action affecting the northern end of the valley, the Basin Commission formally supported incorporating the northernmost 76 miles of the Delaware main stem, from Matamoras, Pa., to Hancock, N.Y., into the National Scenic River System.

A federal-interstate task force is to recommend its inclusion in a report to the Congress and the President.

This popular boating and fishing reach of the river would be kept in its natural state as a recreation and scenic attraction to complement the 35-mile Tocks Island lake and park scheduled for development immediately downstream during the 1970s.

Canoeists are seen in the distance on the Delaware from point where Mongaup River flows into main stem from New York State (next page).



Generator Siting

New requests are banned pending water impact study

With production and consumption of electrical power doubling every decade, the Basin Commission has applied the brakes to further uncontrolled and unsystematic exploitation of the water resources that are critical to generating energy.

The water crop in the Delaware Basin, while plentiful due to an average of more than 40 inches of precipitation yearly, remains constant unlike energy demands. New storage facilities and good resource management stretch the supplies, but the volume of water that can be earmarked for power in the face of competing demands for homes, factories, recreation, quality control and fisheries is limited. Further, better information is needed to determine if resources in given local areas can absorb the shock of prospective nuclear or fossil-fueled power plants, many of which evaporate as much water as a small city consumes.

On the thesis that it would be unwise to continue one-by-one to weigh applications for approval of new generating installations or enlargements, the Commission decreed a halt on new applications for facilities pending preparation of a long-range, basinwide power plant siting blueprint.

In response, nine electric utility companies operating in the Delaware Basin engaged a prominent consulting engineering house to conduct a one-year study that will produce basic water resource information, take inventory of present and planned generating facilities, and estimate the capacity of the basin to support them.

The final document, augmented by additional siting studies by the utilities, will describe in detail current and future plants through 1986 and the impact of each on the basin's water and related land resources, listing fuel sources and water requirements, including evaporative (consumptive) losses. As part of the Commission's own comprehensive plan, it could be kept updated to reflect changing power demands, technology and water resource conditions.

Proposed new plant locations will be weighed in relation to the master siting plan, but only after full disclosure to give concerned government agencies, water users and the general public an opportunity to comment.

Preliminary physical work on a new plant prior to approval of the whole job will be barred if utilities fail to conform to siting requirements. And it would be performed at the applicant's own risk.

A second phase of the siting studies, to focus on minimizing environmental harm, will be sponsored

by the Commission independently of the utilities. The Commission is seeking foundation funds to support this study.

Nuclear Plants

During the year, the Commission approved a utility group's plan to develop the Delaware Valley's first nuclear generating plant — a dual-reactor, 2,100-megawatt installation now under construction on Artificial Island, which juts into the lower river from Salem County.

Unlike two other atomic plant proposals at Newbold Island, Burlington County, N.J., on the Delaware and at Limerick, Montgomery County, Pa., on the Schuylkill River, the Salem plant will discharge cooling water directly to the river.

In approving the Salem plant, the Commission determined that its discharges would not impede fish migrations or nearby recreation values, and that thermal pollution standards can be met without cooling towers due to the large water volume at that wide point. Also, operation would be well within stream radiation limits.

A list of 18 conditions calls for continuing proof by the companies of no substandard pollution conditions on risk of Commission-ordered shutdowns or alterations. The companies also must pay the Commission for some 20 million gallons daily in evaporated water losses that will have to be made up from reservoir storage.

Testimony at public hearings on the Newbold Island and Limerick nuclear proposals reflected strong opposition in the Philadelphia metropolitan area. A board of four consultants comprising water resource, radiation and biological authorities was examining the hearing record and interrogating the utility sponsors in behalf of the Commission as the year ended.

There were two significant federal court rulings this year. Some nuclear power opponents complained that Delaware Basin Commission standards, based on those of the National Radiation Council, are too low. But in the case of a midwestern state which imposed radiological standards higher than those of the National Council, a U. S. judge ruled that the field had been preempted for the Federal Government by Congress. The other decision required that the Atomic Energy Commission investigate all environmental factors, not just radiology as before, in passing judgment on nuclear power plant applications.



Aerial photo shows mouth of winding stream draining part of New Jersey wetlands into Delaware Bay.



Water Quality

Detailed toxic limits are proposed
and the tidewater cleanup advances

The Commission opened another front in its assignment to protect Delaware Basin waters by proposing broad restrictions against a wide variety of pollutants.

The program initiated in the 1960s to halt most of the organic waste discharges that steal oxygen from the water, causing the Delaware's most widespread pollution problem, is well under way. Also being carried out, as a public health precaution, is the three-year-old Commission requirement that all sewage be disinfected to destroy pathogens prior to discharge.

But no less vexing is stream degradation from a variety of mostly inorganic toxic contaminants that pollute in other ways. These include heavy metals, acid, hot water, ammonia, phosphates, oil, dissolved solids and substances causing odor and color problems. The Commission turned its sights on these and other so-called exotic substances as the year drew to a close by proposing imposition of numerical ceilings on tolerable volumes.

The basin's water quality regulations already restrict these dischargers to "negligible" amounts, but the affected public has pressed for more precise guidance. Responding, the Commission proposed numerical limits as interpretive guidelines. A decision on the restrictions pends staff analysis of recent public hearing testimony.

If approved, the guidelines are expected to result in more effective scaledown of these substances being dumped into Delaware streams, and would add one of the nation's first "exotics" limitations programs to America's most advanced oxygen rejuvenation effort, both essential to comprehensive pollution control.

The Estuary

Twenty-seven more dischargers of wastes to the 86-mile estuary, from Trenton to below Wilmington, were brought under pollution abatement schedules

this year. This raised the total number under orders to 67 of the 90-odd municipal and industrial dischargers to the tidal river. In terms of total wasteload they represent an even larger proportion — more than 90 percent — of the lower river's pollution problem.

Zero oxygen conditions in the depressed reach of the river at Philadelphia tend to be diminishing in frequency, intensity and duration, pollution control engineers observed. The oxygen count hit bottom only 20 days last year, as opposed to yearly totals of up to 123 days since the Commission's organic pollution abatement program was initiated.

Also, the State of Delaware, which administers a regular river sampling program for the Commission, reports that conditions appear to be improving in the lower river's oyster fields.

The improvement indicators are attributed to a combination of early upgrading of treatment by some dischargers and to a new general environmental awareness that cuts down on careless and neglectful waste treatment practices.

The Upper River

The two-thirds of the 13,000 square-mile Delaware Valley lying upstream of the head of the tidal estuary at Trenton is essentially a region of good stream quality. As growth in this area continues, preserving present conditions will be easier than completing the massive estuary reclamation below Trenton.

Current research employing a mathematical model of the 50-mile Trenton-to-Easton section will provide DRBC better information on assimilative capacity and help assure effective control of wastes before they enter the estuary.

The first group of abatement schedules to insure high-grade treatment along nontidal waters was adopted this year.

Waste Dischargers

Brought under Abatement Schedules in 1970-71

Discharger	Allowable Discharge*	Full Compliance by
U. S. Naval Base, Philadelphia	52	November 1970
Atlas Chemical Industries, Inc., Wilmington	4,640	February 1974
Main Plant, Burlington Township, N.J.	115	December 1970
LaGorce Square Sewage Plant, Burlington Township	55	December 1970
City Sewerage Authority, Beverly, N.J.	205	December 1970
Main Sewage Plant, Hamilton Township, N.J.	1,540	December 1970
Municipal Utilities Authority, Willingboro, N.J.	490	December 1970
Hercules, Inc., Burlington, N.J.	210	December 1970
Hercules, Inc., Greenwich Township, N.J.	2,480	26 months**
Monsanto Co., Bridgeport, N.J.	4,390	41 months**
Texaco, Inc., Westville, N.J.	692	33 months**
Georgia-Pacific Corp., Delair, N.J.	1,620	December 1972
Getty Oil Co., Delaware City, Del.	3,750	December 1973
J. T. Baker Chemical Co., Phillipsburg, N.J.	****	July 1972
Roscoe Sewer District, Rockland Township, N.Y.	****	October 1972
Army Engineers Dredging Depot, Fort Mifflin, Philadelphia	1	March 1971
B. F. Goodrich Co., Riverside, N.J.	39	March 1971
MacAndrews & Forbes Co., Camden, N.J.	2,720	June 1971
Monroe Chemical Co., Eddystone, Pa.	100	February 1972
United States Pipe and Foundry Co., Burlington, N.J.	***	September 1972
Whippany Paper Board Co., Durham Township, Pa.	****	May 1972
E. I. duPont deNemours & Co., Edge Moor, Del.	4,230	October 1974
E. I. duPont deNemours & Co., Newport, Del.	***	December 1971
Harshaw Chemical Co., Gloucester City, N.J.	260	April 1972
Tenneco Chemicals, Inc., Burlington, N.J.	590	April 1971
Erie-Lackawanna Railway Co., Port Jervis, N.Y.	****	October 1971
Houdry Process & Chemical Co., Paulsboro, N.J.	65	22 months**
Olin Chemical Corp., Paulsboro, N.J.	***	December 1972
Sewerage Authority of Pennsauken, N.J.	1,530	December 1971
Griffin Pipe Products Co., Florence, N.J.	***	March 1973
N. J. Zinc Co., Gloucester City, N. J.	500	January 1974

* Allocated organic discharge to tidal estuary of carbonaceous (first stage) oxygen demand in pounds per day

** Time to be allotted to complete separate treatment facilities if discharger does not participate in proposed Deepwater regional project (Salem and Gloucester Counties) or in Gloucester County Sewerage Authority regional system

*** Discharge to estuary is inorganic

**** A non-tidal discharger not under allocation

Water Quality (cont'd)



Sludge Disposal

At the 1971 annual meeting, the Basin State Governors and U.S. Interior Secretary Morton directed the staff to tackle a phase of another dilemma tied to water pollution control — that of sludge disposal. Sludge is the solid residue from liquid waste treatment that poses yet more serious disposal problems. The issue has received wide official attention recently in view of mounting public protest over ocean dumping, incineration and other current means of disposal. Also, increasing frequency of stream and groundwater contamination due to overflows, leaks and breaks at industrial lagoons containing settled waste pollutants is causing still another severe water quality problem.

A staff report to the Commissioners will contain the results of an inventory of current disposal practices in the Delaware Basin and make recommendations. There appears to be a need for regional consideration of sludge handling with an eye to land reclamation and nutrient conservation.

Spills

Accidental waste spills of a wide variety — pipeline breaks, lagoon and sewerage failures, shipping accidents and so on — persist in causing water pollution problems, although cooperative surveillance and warning procedures have softened the impact.

Seventy-five spills were reported during the year. Perhaps the worst in years occurred in November 1970 when an industrial lagoon collapsed at Douglassville, Pa., sending 2½ million gallons of oil down the Schuylkill River to produce a slick that troubled the area for weeks. Most of the Commission's \$10,000 emergency mopup fund was spent on this and a pair of smaller spills in the Trenton area.

The number of reported spills was high, but this is believed more the result of public awareness than an increase in incidents.

Monitoring and Surveillance

The Governors and Secretary Morton strongly supported a staff proposal to explore the idea of the Commission expanding its pollution monitoring and surveillance program and financing it at least in part through a system of service charges levied on dischargers. The enforcement-related plan could cost \$3 million yearly.

"Non-point" Waste Sources

The staff is also investigating the origin, composition and volume of runoff materials such as silt, animal wastes and chemicals emanating from farms, woodlands and other sources besides treatment plants.

The Commission has contracted with New York State to study the streams in that section of the basin to identify existing biota as part of this project.

Water Quality Certifications

To conform to the Federal Water Quality Improvement Act of 1970, the Commission established formal procedures for determining if water-related projects coming to the Commission for review could operate without violating pollution control standards. During the year, the Commission issued nearly 50 certifications to applicants who cleared the test.

Advisory Committee

Since the Commission's early years, its Water Quality Advisory Committee, comprising professional experts from the five signatory parties, has provided indispensable policy and technical guidance to the staff on the widest variety of pollution matters. It also has supplied a valuable common-ground forum for representatives of five separate jurisdictions. The committee's life was extended five years to 1975.

Regionalized Sewerage

**More sub-basins are consolidating;
Delaware County and Philadelphia may tie in**

The Delaware Basin Commission recognizes that its obligation to hold down stream pollution cannot be fulfilled in the face of continued residential and industrial growth until the four-state valley has far more extensive regional collection, conveyance and treatment of liquid wastes.

Three years ago it became the formal policy of the Commission to promote centralized systems in local watersheds and other logical regions — both those already overburdened with wastes and where preventive action can preserve present good water quality.

This was a year in which substantial gains by the Commission and others enhanced the prospects of attaining widespread tangible results in this field.

Delaware County, Pa.

One of the most seriously overloaded areas in the entire four-state basin is Delaware County, Pa., just downstream of Philadelphia. The county includes the intensely suburbanized Darby Creek watershed, from the headwaters in Chester County through Tinicum Wildlife Preserve and Marsh to the Delaware just below International Airport. Other Delaware County tributary streams further down the river to the City of Chester also are in serious pollution trouble from sewage overloading.

Communities and local authorities in the County have invested deeply in building and upgrading more than a half-dozen sewage treatment facilities, some of them small-scale regional systems. In the face of more growth and limited flows in tributary streams, some of which are described as open sewers, perpetuation of this scattered local approach can lead only to compounding the pollution. The state already has imposed some bans on new sewer connections and threatened more.

The Commission, supported by the Commonwealth, was preparing to impose a regional solution based on its own studies and findings of a special interagency task force as the year ended.

Generally, the regional program will expand the service area of Philadelphia's Southwest treatment plant, an already-regional installation now under orders by DRBC to be sharply upgraded by the mid-1970s, to include the entire Darby Creek Watershed. The downstream portion of Delaware County is to be tied to a new or expanded regional plant in the Chester City area in conformance with a program being developed under a federally-funded regional sewerage study undertaken by the County and supported by the Basin Commission. The program also is acceptable to Philadelphia, which already processes liquid wastes from the other suburbs adjacent to the City, including part of Delaware County.

Existing collection lines are to be augmented by new interceptors to achieve the necessary tie-ins. Interim-use lines to be built immediately will convey present sewage overloads from the Darby Creek area to Philadelphia, while existing plants in Delaware County would continue to treat wastes but at volumes closer to their design capacity pending completion of the Philadelphia plant's expansion. When the regional plants at Philadelphia and Chester are ready for full operation, the smaller plants throughout Delaware County are to be phased out.

Full-county regionalization would not only save 20 percent or more of the cost of continuing the subregional system, but would virtually eliminate wastes from Darby Creek and the other tributaries, restoring their water quality.

Salem-Gloucester System

A year's operation of a million-dollar Commission pilot plant at Deepwater, N.J., produced favorable findings on the compatibility and treatability of a conglomeration of industrial and municipal wastes from sources along nearly 30 miles of Delaware River shoreline in Salem and Gloucester Counties.

The Commission-sponsored study also indicated that the high-efficiency regional collection and



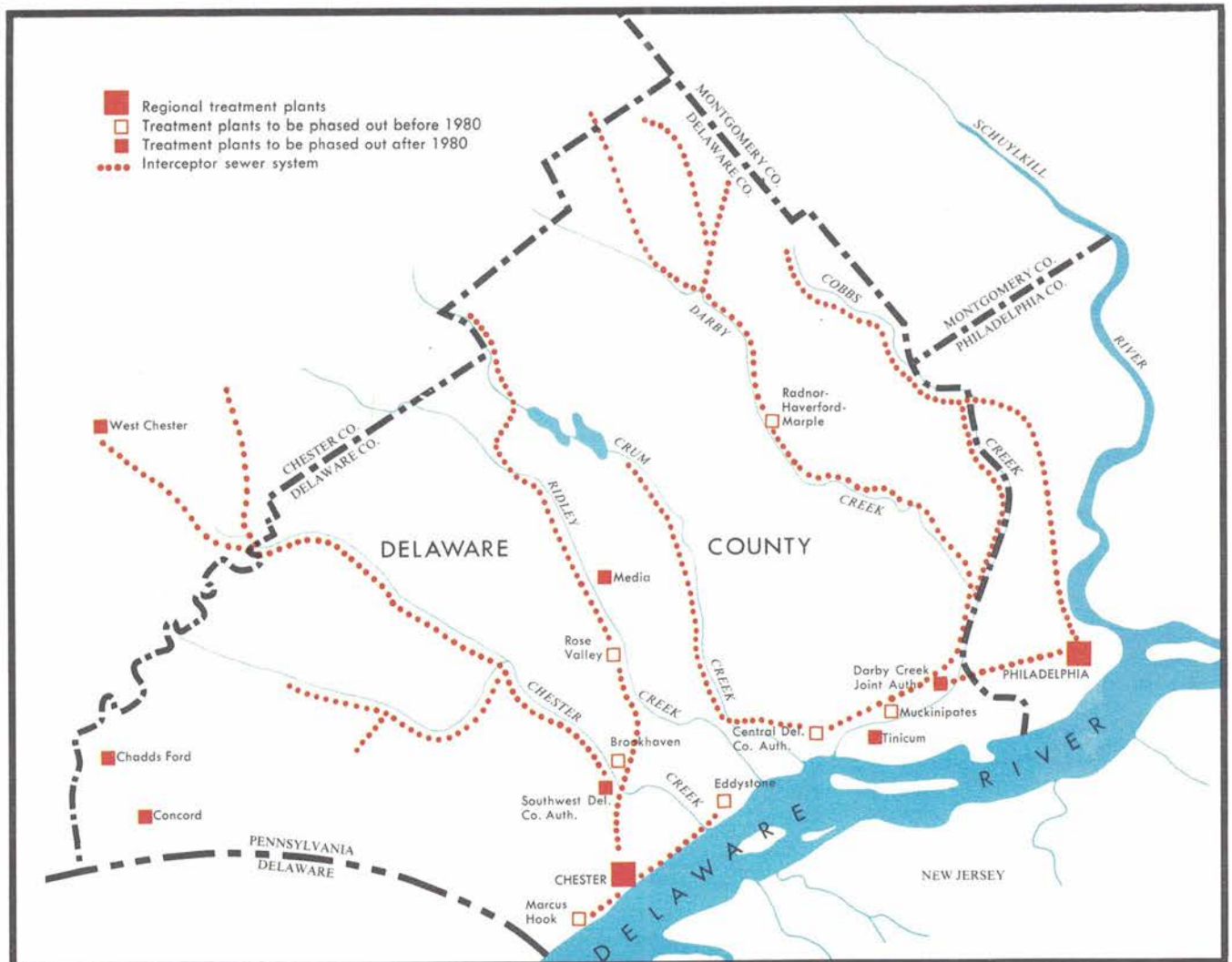
treatment system the Commission has in mind for more effective protection of the river along this fast-developing South Jersey area could be developed and run more economically than if the dozen-odd dischargers continue to go it alone.

With a canvass of dischargers indicating a general willingness to proceed, prospects appeared good for a Commission decision to build the system for operation by a non-profit association of the dischargers, subject to securing federal and state grants and other complex arrangements.

Meanwhile, Gloucester County has moved ahead toward construction of its own consolidated sewerage system, thus bringing regionalism to one Delaware Basin fast-growth area where it is needed most.

Brandywine Creek

Brandywine Creek is an interstate stream originating in Chester County, Pa., and flowing into New Castle County, Del. Growth in the Pennsylvania sector of the watershed has produced a pollution condition,



including spills from industrial sources and sewerage malfunctions, that concerns the State of Delaware, particularly because the stream is Wilmington's principal water supply source.

At the 1971 annual meeting, Governors Peterson of Delaware and Shapp of Pennsylvania pledged to cooperate on a more effective enforcement program and directed the staff to investigate prospects for a long-range regional solution. Pennsylvania is working on stringent stream and effluent standards that would benefit both states.

The Pennsylvania sector of the watershed has three population centers — Downingtown, West Chester and Coatesville. But their growth has not reached the stage where they could afford to tie to a single collection-treatment system, on which feasibility studies will continue.

Commission action on the Brandywine is not new. Twice in the 1960s its regional powers were used to protect Delaware's interest from effects of activities in the upstream Pennsylvania portion of the watershed. One action involved temporary suspension of construction work on a transcontinental liquid petroleum pipeline pending assurances to protect against ruptures that could have resulted in contamination of Wilmington's water supply. The other guaranteed minimum streamflows to Delaware in connection with development of a series of reservoirs in Pennsylvania.

Tocks Island Region

During the year, the Commission released and conducted several local public information meetings on its consultant's report, the Tocks Island Region Environmental Study. The report presented five alternative engineering schemes for handling liquid wastes from the tri-state, six-county area, whose startling rate of summer and year-round home development will necessitate a regional system with or without the Tocks Island reservoir and park.

The study's alternatives range from continuing the present undesirable pattern of separate treatment facilities to a massive conveyance network that would feed a modern regional treatment facility located downstream of the Tocks lake. The Commission staff favors this plan over additional alternatives of three combinations of subregional systems whose effluent would be discharged to the reservoir.

The Commission is awaiting the recommendations of the Maxwell School at Syracuse University on the most feasible organizational and financing approaches to developing a regional sewerage system to preserve the region's good water quality.

Other Areas

Many other local areas in the basin will benefit soon from regionalized water pollution control work now in progress.

Advanced planning is leading to collection of wastes in the suburbs by Camden County, N. J., for delivery to the Camden City plant where treatment is to be upgraded. In neighboring Burlington County a series of subregional plants on tributary streams, most of them in design, are being developed for one of the state's fastest growth areas.

In Delaware, the New Castle County interceptor and treatment plant are undergoing general upgrading and expansion to further accommodate the growing Greater Wilmington service area, which has had regional waste-water disposal for years. Meanwhile, collection line construction is in progress in Kent County, and a new central treatment plant is to be built soon.

In Pennsylvania, more than a half-dozen towns in the Valley Forge area have completed a plan to tie together soon in a single system. Upper Neshaminy Creek growth led to a study of regional needs for the valley, and a proposed program sponsored by Bucks County gained DRBC sanction.



Annual Meeting 1971



DRBC's 1971 annual meeting, attended by Governors Peterson, Shapp and Cahill and Secretary Morton, was held in Dover, Del. Scenes are at conference and public session.



Financial Summary

Budgetary

1971 REVENUES

Budgeted	Received
Delaware 76,800	76,800
New Jersey 319,400	319,400 ⁽¹⁾
New York 278,400	278,400
Pennsylvania 316,600	316,000 ⁽¹⁾
U.S. 175,000	175,000
EPA Grant 171,000	139,502 ⁽²⁾
Miscellaneous 2,000	5,163
Signatory Balance 22,800	22,800
TOTAL 1,362,000	1,333,065
	28,935 ⁽³⁾
1,362,000	

(1) Includes capital appropriation of \$1000

(2) \$31,498 of grant amount not received

(3) Net revenue loss

(4) Includes \$225 unexpended funds and \$32,098 in budgeted revenue not received.

The records of the Commission are independently audited each year as required by the Compact.

1971 EXPENDITURES*

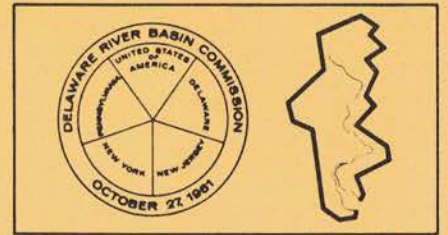
	Appropriations	Expended
By Organization		
Directorate	180,582	215,574
Administrative Division	140,120	183,262
Planning Division	1,039,298	928,841
TOTAL	1,360,000	1,327,677
By Program		
WATER SUPPLY	64,000	32,099
WATER DEMAND	37,000	4,498
RECREATION	52,000	98,441
POWER	11,000	50,513
PROJECT REVIEW	134,000	133,274
WATER QUALITY	565,000	593,132
COMPREHENSIVE PLAN	221,000	269,300
FLOOD LOSS	71,000	6,479
BASIN OPERATION	117,000	111,755
SMALL WATERSHEDS	88,000	28,166
TOTAL	1,360,000	1,327,677
Capital Program	2,000	2,000
Excess or Deficit in Appropriations or Receipts over Expenditures		32,323⁽⁴⁾
GRAND TOTAL	1,362,000	1,362,000

*Expenditure figures subject to audit of computerized cost analysis report.

Non-Budgetary

	Funds Available	Expenditures	Unexpended Dedicated Allotment
Tocks Island Region Environmental Study	8,794	107	8,687
Tocks Island Fish Research	31,388	7,429	23,959
Deepwater Regional Study	440,594	456,377	(15,783)
TOTAL	480,776	463,913	16,863

Delaware River Basin Commission
25 State Police Drive • West Trenton, N.J.
(Box 360, Trenton 08603 - Mail)



Sunset over the Delaware at Minisink Ford, N.Y.



Whereas the water resources of the basin are presently subject to the duplicating, overlapping, and uncoordinated administration of some forty-three State agencies, fourteen interstate agencies, and nineteen Federal agencies which exercise a multiplicity of powers and duties resulting in a splintering of authority and responsibilities; and

Whereas demands upon the waters and related resources of the basin are expected to mount rapidly because of the anticipated increase in the population of the region projected to reach thirty million by 1980 and forty million by 2010, and because of the anticipated increase in industrial growth projected to double by 1980; and

Whereas water resources planning and development is technical, complex, and expensive, and has often required fifteen to twenty years from the conception to the completion of a large dam and reservoir; and

Whereas the public interest requires that facilities must be ready and operative when needed, to avoid the catastrophe of unexpected floods or prolonged drought, and for other purposes;

Now therefore

The states of Delaware, New Jersey and New York and the Commonwealth of Pennsylvania, and the United States of America hereby solemnly covenant and agree with each other, upon the enactment of concurrent legislation by the Congress of the United States and by the respective state legislatures, having the same effect as this Part, to the following Compact:



**delaware river
basin commission**