

Samuel S. Baxter Memorial Award
Mr. Stephen J. Tambini
Executive Director, Delaware River Basin Commission

Steve Tambini's water resources career spans 40+ years, during which Steve has influenced, produced, or led others in producing exceptional water resource science, planning, policy, and implementation. Steve's contributions have improved water quality, resilience, and equity for millions of water users in the mid-Atlantic region of the United States. Throughout his career, Steve has modeled personal integrity and exceptional skills in management, strategic planning, communication, and diplomacy, most recently as Executive Director of the Delaware River Basin Commission, a role in which he has served since August 2014. In March 2024, Steve announced his retirement from DRBC, effective December 1, 2024.

Steve earned his B.S. in Civil and Environmental Engineering and M.S. in Environmental Engineering from Clarkson University. He is a registered professional engineer in New Jersey and New York.

Steve played a key role in planning, designing, and permitting a 30-mgd surface water treatment facility on the Delaware River. New Jersey selected the project in 1993 to provide an alternative water source after excessive groundwater pumping created the potential for brackish water from the Delaware Estuary to contaminate a drinking water aquifer on which hundreds of thousands of New Jerseyans rely.

Since 2014, Steve has served as executive director of the Delaware River Basin Commission (DRBC or "Commission"), the federal and interstate compact agency charged with managing the water resources of the Delaware Basin across political boundaries. Under Steve's leadership, the Commission has advanced water security for more than 14 million Americans by developing the scientific foundation for upgrading aquatic life use standards in the Delaware Estuary to include propagation; reaching consensus on a ban on high volume hydraulic fracturing; providing expert modeling and analytical support for an adaptive flow management program; launching DRBC's Advisory Committee on Climate Change; developing a calibrated, 3D hydrodynamic and salinity model to evaluate how sea level rise will affect the Delaware Estuary; performing water demand and supply studies to evaluate water sustainability throughout the basin; securing support for the Commission's work through increased federal grant and signatory funding; and deepening

engagement with communities and stakeholders throughout the Basin including developing the Commission's first Diversity, Equity, Inclusion, Justice, and Belonging (DEIJB) plan, among other milestones.

Steve has recognized the importance of collaboration in water resource management and has actively engaged in regional collaboratives and professional associations throughout his career. His astuteness and congenial manner make him a natural leader, and he has been rewarded with leadership positions in such organizations as the American Water Works Association, the National Association of Water Companies, and the Water Resources Association of the Delaware River Basin. He was an active representative of utilities on the New Jersey Governor's Water Supply Advisory Council and has provided significant input on each of New Jersey's three statewide water supply plans. In his role as Executive Director of the DRBC, Steve has served ably in an advisory capacity with the Delaware Estuary Program, Pennsylvania Water Resources Advisory Council and Pennsylvania State Water Plan, Delaware River Watershed Conservation Collaborative, Schuylkill Action Network, and other multi-stakeholder initiatives. He also serves on the board of directors of the Rancocas Conservancy.

Steve is a member of LeadNJ's Class of 2010 and the Pennsylvania Business Council Executive Leadership Program's Class of 2012.

Upon learning of Steve's planned retirement, New Jersey Governor Phil Murphy, the DRBC's chair at the time, remarked that "Under Steve Tambini's impeccable leadership, the DRBC has significantly advanced water science and policy. From helping to address and combat the effects of climate change, improving water quality, and ultimately expanding water security for over 14 million people, Steve has left an undeniable impact on our state." It is fair to say that Steve has had an undeniable impact on water security and sound governance in our region, and his is a legacy worthy of recognition.

A BODY OF WORK FOCUSED ON SOUND WATER RESOURCE MANAGEMENT

Steve's body of work is presented below in two parts. The first focuses on Steve's 30-year tenure at American Water, currently the largest regulated water and wastewater utility company in the United States. The second focuses on Steve's decade-long tenure as Executive Director of the DRBC, the interstate and federal compact agency formed by the four basin states and the federal government in 1961 to manage the water resources of the Delaware River Basin across political boundaries. The Basin comprises a 13,539 square mile area in Delaware, New Jersey, New York, and Pennsylvania. Fourteen million people rely on the Basin's water resources.

PART I - TRI-COUNTY WATER SUPPLY PROJECT, AND STEVE'S TENURE AT NEW JERSEY AMERICAN WATER COMPANY

At American Water, Steve played a key role in the planning, design and permitting phases of the 30-million-gallon-per-day surface water treatment facility and intake on the Delaware River, known as the Tri-County Water Supply Project. Development of this project has improved water quality and water security for hundreds of thousands of southern New Jersey residents.

The New Jersey Department of Environmental Protection (NJDEP) in 1993 designated as "Water Supply Critical Area #2" an area centered on Camden County, and including most of adjoining Burlington and Gloucester counties and much of western Atlantic County, due to excessive drawdown of the underlying Potomac-Raritan-Magothy, or P-R-M, Aquifer. Depletion of groundwater in the region had reversed the aquifer's natural flow toward the Delaware River.

Because the Delaware is an estuary to a point approximately 30 miles upstream of Camden, drawdown of the P-R-M thus created the potential for saltwater intrusion to degrade groundwater quality for dozens of southern New Jersey municipalities.

After careful study of alternative water supplies, the NJDEP selected New Jersey American Water Company to build the Tri-County Water Supply Project. The project, including a large surface water diversion from the Delaware River near Delran, New Jersey, an accompanying 40-million-gallon-per-day treatment facility, and forty miles of delivery pipeline was completed and placed into operation in 1996. It now serves hundreds of thousands of water users in Burlington, Camden and Gloucester counties.

As New Jersey American's Engineering Project Manager for the new facilities, Steve worked with the State of New Jersey, other water utilities, and local and county planning agencies, to among other things craft rules for cutting back groundwater usage in the region by 35 percent. Since the Tri-County Water Supply Project was completed, the Delran intake has provided water to meet growing demand and reduced reliance on groundwater sources. According to NJDEP's *2024 New Jersey Statewide Water Supply Plan (Draft for Public Comment)*, whereas water supply in the region was "highly stressed prior to initiation of management activities," the level of stress today is "substantially reduced and managed."

Steve was appointed Vice President of Engineering and a Director of New Jersey American in 2000. His thought leadership in the water industry led him to chair the Water Utility Council of the New Jersey Section of the American Water Works Association for several years. He was an active representative of utilities on the New Jersey Governor's Water Supply Advisory Council and has provided significant input on each of the state's three statewide water supply plans developed since enactment of the New Jersey Water Supply Management Act in 1981.

PART II – STEVE’S WORK AT THE DELAWARE RIVER BASIN COMMISSION

Achievements that mark Steve’s leadership of the Delaware River Basin Commission from 2014 to the present are described below. The Commission’s members are the governors of the four basin states—Delaware, New Jersey, New York, and Pennsylvania—and on behalf of the federal government, the North Atlantic Division Commander, United States Army Corps of Engineers. Most actions of the Commission require the favorable vote of at least three members.

Regulations prohibiting high volume hydraulic fracturing (HVHF) and the discharge of HVHF wastewater in the Delaware River Basin. (2014 – 2022)

The entire non-tidal reach of the Delaware River, which extends 197 miles from Hancock, New York to Trenton, New Jersey, is characterized by water quality that is better than established water quality standards require. Three-quarters of this reach is included in the [National Wild and Scenic Rivers System](#), and the entire reach has been designated by the DRBC as “Special Protection Waters” or “SPW.” Within the drainage area of these exceptionally high-quality waters, discharges of 10,000 gallons per day or more are subject to an antidegradation management regime for which the objective is “no measurable change, except toward natural conditions.” Most of the land draining to DRBC’s SPW in the Pennsylvania portion of the Basin and nearly all of that draining to SPW in the New York portion of the Basin is underlain by the Marcellus and Utica shales. (See map at <https://www.nj.gov/drbc/programs/natural/index.html>.) Much of the land is forested. Across this region, water users depend primarily upon groundwater for drinking water and other uses. The Commission has long prohibited the introduction into groundwater of harmful substances or substances in toxic amounts.

When the technique of high-volume hydraulic fracturing (HVHF) first came into use for the extraction of natural gas from shale in 2008 and 2009, the Commission’s then-executive director out of concern about the potential adverse effects of HVHF on water resources, announced that natural gas extraction activities would be subject to DRBC’s review. By unanimous vote at a public meeting in May of 2010, the Commissioners determined that they would conduct such reviews only after the Commission promulgated regulations applicable to these projects.

Regulations were developed and proposed, but none were adopted during the tenure of Steve’s predecessor. (See <https://www.nj.gov/drbc/programs/natural/archives.html>.) When Steve became Executive Director in 2014, this unfinished business was thus a top priority for the organization.

Bringing four states and the federal government to agree on a path forward for natural gas in the Delaware Basin was no small challenge. During the first three years of his tenure, Steve gracefully navigated intense public pressure from interest groups on either side of the issue. He led the staff in refining its previously published regulations and exerted his best efforts to bring the Commissioners to consensus on a strong rulemaking package.

When, in September 2017, the Commissioners re-directed the staff to prepare and publish for public comment a new set of regulations, to include, among other things, "prohibitions relating to the production of natural gas utilizing horizontal drilling and hydraulic fracturing within the Basin," Steve expertly guided the staff in developing new regulations prohibiting HVHF within the Basin.

Under Steve's leadership, DRBC published the new proposal in November 2017, and delivered a public process on this controversial rulemaking that was unprecedented at DRBC at that time. Six public hearings and a new online comment collection system afforded opportunity for significant and meaningful public input on the controversial rule. In spite of high emotions on the part of opponents and proponents of natural gas development in the Basin, the process was peaceful and ran smoothly. By the close of the comment period on March 30, 2018, the Commission had received nearly 9,000 comment submissions and many tens of thousands of pages of material to which the small DRBC staff had to respond.

Steve's superb management and diplomacy were critical to the development of consensus rule language; a 500-page comment and response document, including a detailed bibliography; and adoption by the Commission on February 25, 2021, of rules prohibiting HVHF in the Basin with the support of all four Basin states. (See https://www.nj.gov/drbc/about/regulations/final-rule_hvhf.html.)

But the Commission was not finished with this difficult matter. On the day the Commissioners adopted the HVHF prohibition, they directed Steve and the DRBC staff to develop and publish for comment amendments to the Commission's regulations concerning transfers of water and wastewater into and out of the Basin, in part to address the risks posed by the disposal of natural gas wastewater to the Basin's water resources and to public health. Again under Steve's leadership, in under two years, a separate rulemaking, among other things prohibiting the discharge of wastewater from HVHF and HVHF-related activities to waters or land within the Basin, was adopted on December 7, 2022, with the support of all four basin states. The rule recognized the Delaware River Basin's limited water quantity, susceptibility to drought and limited capacity to assimilate wastewater. (See https://www.nj.gov/drbc/about/regulations/final-rule_import-export-hvhf-discharge.html#5.)

Steve's exceptional diplomatic and management skills, his emphasis on science-based decision-making, his concern for the public welfare, his respect for the Commission's authority, and his calm and sure leadership all were critical to bringing about the Commission's final rules for protecting the water resources of the Delaware River Basin from the potential adverse effects of natural gas development.

Advancing Science and Policy to Improve Dissolved Oxygen Conditions in the Delaware Estuary (2014 – Present)

Also under Steve’s leadership as Executive Director of the DRBC, modeling, monitoring, and scientific and engineering analyses performed by the Commission’s technical staff have illuminated the path forward to attaining aquatic life water quality standards that meet the "fishable" waters goals of the Clean Water Act in a heavily industrialized and densely populated reach of interstate waters.

When the DRBC was created in 1961, little or no dissolved oxygen (DO) was present in the Delaware River Estuary from Wilmington to Philadelphia for periods of up to six months each year. (See https://www.nj.gov/drbc/programs/quality/DO_nutrients.html.) Indeed, improving the condition of the Estuary was one of the factors motivating the Basin states and the federal government to create the Commission. In 1967 the DRBC adopted regulations designating aquatic life uses and establishing the numerical water quality criteria necessary to protect those uses. At the time, these criteria were aspirational. Even so, dissolved oxygen concentrations sufficient to support “fish propagation,” a use that includes reproduction and juvenile development, were not deemed attainable within the 38-mile reach extending from Northeast Philadelphia to Wilmington, Delaware.

Improvements in Estuary water quality and fish populations in the decades since have been remarkable, thanks in part to DRBC’s regulation in 1968 of carbonaceous biochemical oxygen demand (the driver of low dissolved oxygen in the river at that time) discharged by treatment plants; investment in wastewater treatment infrastructure following adoption of the Clean Water Act in 1972; coordinated interstate and federal water quality management on an ongoing basis; and practical improvements by wastewater treatment plant engineers and operators. As a result of these efforts, DO levels in the Delaware River Estuary steadily improved, to the point where the designated uses and the oxygen levels (numeric DO criteria) established to support those uses have been achieved.

The question confronting the Commission, the basin states and EPA when Steve assumed leadership of the Commission in 2014 was (and remains) whether the water quality standards should now be upgraded to include propagation throughout the Estuary, including within the 38- mile reach that is referred to by DRBC as the “Fish Maintenance Area” (“FMA”). Under current conditions, DO levels in the FMA support fish maintenance at all times of the year, but a DO “sag” occurs during the summer months in some years, making conditions unsuitable for propagation of certain DO-sensitive species, including the federally-listed, endangered Atlantic sturgeon.

The matter of elevating the standards remains a contentious one. When Steve joined the Commission in 2014, whether DO levels capable of supporting propagation in the FMA were even attainable was still in question. Accordingly, under Steve’s leadership, by resolution of the Commission in September 2017, DRBC technical staff embarked upon an intensive series of

studies to identify the DO levels required to support sensitive species and determine whether these levels could be attained. (See <https://www.nj.gov/drbc/programs/quality/designated-use.html>.) It did so through a transparent and collaborative process that involved frequent public meetings of the Commission's Water Quality Advisory Committee, on which dischargers, the scientific community, environmental groups, and co-regulators are represented.

Through scientific and technical studies between 2017 and 2021, the DRBC:

- identified the DO requirements of important resident and migratory fish species utilizing the Estuary, including the spatial and temporal distribution of the life stages of these species;
- conducted extensive ambient nutrient monitoring and primary productivity and algal speciation studies to support model calibration;
- with the support and close collaboration of a panel of nationally recognized experts, developed and calibrated a 3D eutrophication model (linked hydrodynamic and water quality models) of the Delaware Estuary and Bay. The model relates nutrient loads from point and non-point sources to DO targets, and was used to evaluate the attainability of various DO conditions and aquatic life uses and determine load and wasteload allocations necessary to achieve these uses;
- identified and evaluated the capital and operating costs required for the twelve largest wastewater treatment plants in the Estuary to implement technologies for achieving higher levels of dissolved oxygen; and
- performed technical and socioeconomic evaluations of upgrading designated aquatic life uses to include propagation in the portion of the Estuary currently designated for fish maintenance only.

The work demonstrated that:

- The addition of technically feasible advanced treatment by nine major wastewater treatment plants discharging to the Estuary would significantly improve the level of dissolved oxygen and result in water quality supporting the aquatic life use of "fish propagation" throughout the Estuary, including in the FMA.
- The capital, operations, and maintenance costs of advanced treatment associated with the recommended scenario would be significant; however, analyses using metrics developed by the EPA and by the utility industry (AWWA), respectively, indicated that the cost of adding such treatment would not increase the affordability burden category, as

defined by either method, for households within the service areas of the affected treatment plants.

In December 2022, the EPA determined that revising the water quality standards within the FMA was necessary to satisfy the requirements of the Clean Water Act. In doing so, EPA recognized the value of the foundational science performed by the DRBC, including to demonstrate that propagation throughout the Estuary is attainable. EPA further acknowledged that the timeline for establishing new standards would be accelerated by the "readily available information that DRBC and other stakeholders have generated." In its determination, the EPA stated that it "acknowledges and appreciates DRBC's and [the Estuary states'] commitment to updating the WQS for the specified zones of the Delaware River Estuary."

Throughout 2023, the DRBC worked closely with EPA to provide critical scientific, technical, and engineering assistance to support EPA's process for revising the aquatic life designated uses and corresponding criteria for the affected reaches of the Estuary to meet the shared goal of updated water quality standards that improve protections for aquatic life. EPA's notice of proposed rulemaking to amend the standards appeared in the Federal Register in December 2023 (see <https://www.federalregister.gov/documents/2023/12/21/2023-27758/water-quality-standards-to-protect-aquatic-life-in-the-delaware-river>) and is currently pending.

Steve's leadership on this complex interstate water quality matter has been exceptional. Under his management, guidance and direction, DRBC has provided a strong scientific foundation, through a highly transparent process, for major water quality improvements affecting critical aquatic habitat and millions of people in three states.

Increasing Regulatory Efficiency Through the "One Permit Program" (2014 – 2016)

The centerpiece of the [Delaware River Basin Compact](#) ("Compact"), the state and federal law that created the DRBC, is a requirement that the Commission develop, adopt, and periodically revise, a comprehensive plan for the immediate and long range development and uses of the water resources of the Basin. Compact §§ 3.2(a) and 13.1. The Compact empowers the Commission to effectuate the comprehensive plan through a variety of means. Among these is a requirement that DRBC review any project having a substantial effect on the Basin's water resources to ensure the project will not substantially impair or conflict with the comprehensive plan. Accordingly, many projects involving water withdrawals, discharges, and other activities are subject to review by both the Commission and one or more of the specialized agencies of its member states and the United States.

The Basin states value their ability through the Commission to review projects located in a neighboring state. However, for routine reviews, they and project sponsors sought a more streamlined process. An informal directive of the member states to Steve at the outset of his tenure was to put in place rules and administrative agreements that would allow for a single state

agency-led process resulting in the issuance of single instrument of approval that would include all state and DRBC conditions applicable to a withdrawal or discharge project subject to the review of both agencies.

Under Steve's leadership, and within fourteen months of his arrival at DRBC, the staff completed a notice-and-comment rulemaking in 2015 establishing the One Permit Program. (See <https://www.nj.gov/drbc/about/regulations/administrative-agreements.html#1>. Also see 18 C.F.R. 401.42.) The Commission and the environmental agencies of two of its member states— New Jersey and New York—entered into administrative agreements in 2015 and 2016, respectively, to implement the new program for certain classes of projects in these states. (See <https://www.nj.gov/drbc/about/regulations/administrative-agreements.html>.)

The swift development and implementation of the One Permit Program exemplifies Steve's skills as a manager and his commitment to the continuous improvement of administrative processes in the service of effective water resource management.

Forging a Coordinated Response to Basin-wide Drought Conditions (2016)

During periods of basin-wide or lower basin drought in the Delaware Basin, DRBC coordinates management of water stored in public and private reservoirs and adjusts flow targets and out-of- basin diversions to preserve and protect water supplies.

In response to declining storage and increasing precipitation deficits in 2016, Steve led a coordinated response on behalf of the Commission's member states and the federal government. This included a public hearing on the water shortage issues affecting the Basin, followed by a special meeting of the Commission, at which the Commissioners unanimously approved a resolution providing for coordinated operation of regional reservoirs, out-of-basin diversions, and Delaware River flow objectives in response to persistent dry conditions.

Fortunately, the drought of 2016 was short-lived. Steve's leadership nevertheless ensured a plan of operations was in place when it was needed to manage the shortage with minimum adverse economic and ecological impacts, whatever its duration.

Supporting Adaptive Flow Management Under the 1954 Supreme Court Decree and the Delaware River Basin Compact to Balance the Water Supply Needs of the Four Basin States, New York City, and Stakeholders (2014 – Present)

In 1954 the United States Supreme Court issued a decree in the case of *New Jersey v. New York* (the "Decree") that established an equitable allocation of the waters of the Delaware River Basin under federal common law. The decree established the rights of New York City and New Jersey to divert water out of the Basin. It instituted a minimum flow target at Montague, New Jersey, that was to be maintained by compensating releases from the City's Delaware Basin reservoirs

whenever the target could not be sustained by natural flows. In any year in which the City's water use fell short of its anticipated use, the Decree provided for the seasonal release from the City's Delaware system reservoirs of an "Excess Quantity" (the "ERQ"). The Decree established a formula for calculation of the ERQ based in part on the combined "safe yield" of the City's Delaware, Catskill, and Croton system reservoirs.

However, the 1954 Supreme Court Decree did not anticipate or address issues such as flooding, a new drought of record, increased demand for recreational and ecological flows, and water quality management, leaving such matters subject to continued interstate conflict. Cooperative interstate water resource management took hold when the four basin states and the United States in 1961 enacted the Delaware River Basin Compact and established the DRBC. Since then, the basin states, the federal government, DRBC staff, and New York City have cooperatively adapted reservoir operations and flows in an effort to balance competing demands under varying hydrologic conditions.

During Steve's tenure at DRBC, the Commission provided critical support to this ongoing process by convening the decree parties and committing staff expertise and resources to ongoing flow management analyses. Among the results has been the 2017 renewal with refinements of an operating agreement the parties initially reached in 2007. The Commission also developed a three-dimensional model for predicting salinity concentrations in the Delaware Estuary, a tool critical to evaluating different flow regimes and to protecting Estuary drinking water intakes that serve the City of Philadelphia and dozens of municipalities in southern New Jersey.

Increasing Water Security and Climate Resilience (2014 – Present)

Climate change poses multiple challenges for basin-wide water management and water security. Higher temperatures and evaporation may create a greater likelihood for rapid onset drought conditions during periods of low rainfall. The seasonality of flows also may change as a result of diminished snowpack. And sea level rise may require increased releases from reservoir storage to augment freshwater flows in the main stem Delaware River to impede the movement of salt upstream in the Delaware Estuary. Managing salinity in the Estuary is critical to protecting public water supply intakes. Industrial and other intakes may also be adversely affected by increased salinity.

Steve has initiated a suite of measures for addressing the challenges to water supply security in the Basin posed by climate change. These include measures to ensure the Commission has the highest quality data and information possible, and to conduct modeling, research, and analysis based on that information to support planning and policy.

Under Steve's leadership, the Commission has established or developed the following:

- ***Advisory Committee on Climate Change.*** In 2019, on Steve's initiative, the Commissioners established the Advisory Committee on Climate Change (ACCC) to, among other things, identify threats and vulnerabilities in the Basin related to climate change and develop and provide guidance to the Commission on science-based planning scenarios. (See https://www.nj.gov/drbc/about/advisory/ACCC_index.html.) Like the Commission's other technical advisory committees, the group is comprised of experts from each of the Basin states, federal agencies, non-governmental organizations, academia, regulated entities and community and watershed organizations. Its members share information and advise the Commission on science, policies, and programs.
- ***Interactive Tool for Projecting Extreme Precipitation.*** Steve committed agency resources to the development of a tool for estimating future changes in the intensity, duration, and frequency (IDF) of precipitation events throughout the Delaware Basin. Based on regional climate models, the tool generates curves representing how climate change could impact future rainfall patterns in specific locations. The curves can be plotted against historical data to compare outcomes, helping to inform local stormwater management and infrastructure design and improve climate resilience. The tool went live in 2024. (See <https://www.nj.gov/drbc/programs/flow/idf-curves.html>.)
- ***Basin Water Withdrawal and Consumptive Use Estimates Through 2060.*** A key responsibility of the DRBC is to ensure that Delaware Basin water users have a sustainable supply of suitable quality water. Reliable projections are essential to planning for sustainable supply. Steve initiated a new study to project withdrawals in the Delaware Basin. Because traditional projection methods based on population growth have proven inaccurate for the Basin, Steve and the DRBC team took a new approach. Using approximately 30 years of withdrawal data, they identified trends for each withdrawal system or source to make projections through the year 2060. Steve also encouraged staff to use new visualization tools and technologies. The October 2021 study was accompanied by a software application that allows users to explore and display the report data selectively. (See <https://www.nj.gov/drbc/programs/supply/use-demand-projections2060.html>.)
- ***Groundwater Availability Study.*** Once the Commission had a good understanding of future water withdrawals, it initiated studies of water availability. The Basin's groundwater resources provide up to 500 million gallons per day for human use, the majority of which is for public water supply (54%), with self-supplied domestic uses (22%) and irrigation (8%) as secondary and tertiary uses. The Commission already has in place a program for limiting groundwater withdrawals in a region of southeastern Pennsylvania where the geology cannot support heavy use, and where alternative supplies have been developed.

Conjunctive use under that program has restored balance in this region. The groundwater availability study initiated by Steve and completed in 2022 indicates that groundwater is being used at sustainable rates in most areas within the Delaware River Basin and is forecast to continue to be used sustainably through 2060. (See https://www.nj.gov/drbc/library/documents/DRB_Rpt_GW_Availability_dec2022.pdf.)

- **Surface Water Availability Study.** Under Steve's leadership, this companion study to the evaluation of groundwater availability has been initiated but is not yet complete.
- **Evaluation of Potential Additional Storage Opportunities.** Steve recognized the importance of assessing the adequacy of existing storage and exploring the feasibility of adding freshwater storage to meet the Basin's future water availability, climate adaptation, drought management, and flow management needs. Under his direction, the Commission developed and in April 2023 published a study exploring the feasibility of additional freshwater storage in the Basin. This forward-looking work is the most comprehensive, Basin-wide evaluation of potential storage options developed for the Delaware Basin in more than 40 years. (See https://www.nj.gov/drbc/programs/flow/reservoir-storage_study.html.)
- **Comprehensive Assessment of DRBC's Water Audit Program (2012-2021).** The Commission has been an aggressive promoter of water conservation throughout its history. Since 2012, it has required purveyors with sources or service areas in the Delaware Basin to perform an annual water audit conforming to the IWA/ AWWA Water Audit Methodology and corresponding AWWA guidance, using AWWA's free Water Audit Software (Delaware River Basin Water Code § 2.1.8). DRBC is one of only a handful of regulatory agencies in the United States to require use of the improved approach to water loss accounting made possible by the IWA/ AWWA methodology. Since the program's inception, DRBC has collected water audit reports from nearly 300 systems annually. It published assessments of the data in 2012, 2014 and 2016. Under Steve's leadership, the staff most recently studied ten years of water audit data and released *A Comprehensive Assessment of the Delaware River Basin Commission's Water Audit Program (2012-2021)*. This study is the first comprehensive look at the data collected through the water audit program, specifically assessing trends and progress, and evaluating the room left for improvement. (See <https://www.nj.gov/drbc/programs/supply/water-audit-program.html>.)
- **Salinity Study (2024).** Under Steve's direction, DRBC engineers and scientists developed a calibrated three-dimensional hydrodynamic and salinity model and used it to evaluate how sea level rise will affect salinity in the Delaware Estuary. The study has been presented in draft to the DRBC commissioners and the Advisory Committee on Climate Change and is expected to be released in final form later in 2024.

- ***Climate Resilience Plan (2024).*** In addition to the modeling, research, and analytical studies outlined above, Steve initiated the development of a plan of prioritized DRBC actions—a Climate Resilience Plan—for evaluating the impacts of climate change on water resources of the Basin and formulating management approaches to improving resilience and adaptation. A resolution of the Commissioners on this initiative is expected to be adopted during a quarterly meeting of the body during the current calendar year.

Deepening Engagement with Communities and Stakeholders in the Basin (2014-Present)

- ***Community Engagement (2019-present).*** Under Steve’s leadership, DRBC increased its engagement with partners in government, as well as Basin stakeholders and underrepresented communities, and led a culture change among staff that decision-making is strengthened when the Commission hears from a wide range of stakeholders and views. DRBC visibility has increased through participation in outreach events in all our basin states. The *Our Shared Waters* initiative, begun in 2019, connects water users, conservation groups, government agencies and businesses throughout the basin to learn about the current state of the Basin and the opportunities available to support its continued sustainability now and for future generations.
- ***Developing and Implementing DRBC’s First Strategic Plan for Diversity, Equity, Inclusion, Justice and Belonging (2020-present).*** The murder of George Floyd in May 2020 triggered a reckoning across America with our history of disparate treatment of American citizens based on race. The incident also inspired self-examination on the part of public and private institutions, and initiatives to recognize and instill the values of diversity, equity, inclusion, justice, and belonging into workplace policies and practices at all levels. Like many leaders, Steve took this opportunity to work with DRBC staff, Commissioners, member agency experts, and outside partners to develop the Commission’s first diversity, equity, inclusion, justice, and belonging strategic plan. Characteristically for Steve, the values the plan is intended to advance were applied in creating it, such that staff members assumed ownership of the goals and implementation strategies they are now responsible for effectuating. (See <https://www.nj.gov/drbc/about/staff/DEIJ.html>.)
- ***Caring for our Communities (2014-present).*** Steve fostered a culture of caring for our basin communities, with staff volunteering time for numerous public service projects over the years, from river and park cleanups to staffing and giving to local food banks.

Contributing to Multi-Stakeholder Initiatives (throughout Steve’s career)

Throughout his career, Steve has recognized the importance of collaboration in water resource management and has actively engaged in professional associations and regional collaboratives.

His astuteness and congenial manner make him a natural leader, and he has been rewarded with leadership positions in such organizations as the American Water Works Association, the National Association of Water Companies, and the Water Resources Association of the Delaware River Basin. In his role as Executive Director of DRBC, Steve has served in an advisory capacity with the Delaware Estuary Program, Pennsylvania Water Resources Advisory Council and Pennsylvania State Water Plan, Delaware River Watershed Conservation Collaborative, Schuylkill Action Network, and other multi-stakeholder initiatives. He also serves on the board of directors of the Rancocas Conservancy and is a member of LeadNJ's Class of 2010 and the Pennsylvania Business Council Executive Leadership Program's Class of 2012.

Whether Steve is in a leadership or merely an advisory role, his ability to see through the weeds to the core of an issue, his practical and methodical approach to problem solving, his technical expertise, his integrity, and his congenial manner make him a highly valued and influential contributor. His positive effect on his colleagues and the high quality of the work he has guided or helped them to produce make his legacy in water resource management significant and worthy of recognition.