



**AMERICAN  
RIVERS**

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# Equity and Green Investments

in the State Revolving Funds  
of the Delaware River Watershed  
*2009-2021*

February 2023



DELAWARE RIVER AERIAL  
GILBERTO VELEZ-DOMENECH/LIGHTHAWK

# Acknowledgements

**American Rivers** is championing a national effort to protect and restore all rivers, from remote mountain streams to urban waterways. Healthy rivers provide people and nature with clean, abundant water and natural habitat. For 50 years, American Rivers staff, supporters, and partners have shared a common belief: **Life Depends on Rivers.**<sup>SM</sup>



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**This report was generously funded by the William Penn Foundation. The opinions expressed herein are those of the authors and do not necessarily reflect the views of the Foundation.**

American Rivers seeks to amplify Indigenous leadership in river protection, policy, and land stewardship. We work together with Tribal Nations and Indigenous Communities to prioritize protecting and restoring rivers that are culturally and ecologically significant.

We acknowledge the impact of settler colonialism and the deep injustices that persist. We support the thriving work of sovereign Tribal Nations as stewards of land and rivers, and we honor the traditional ecological knowledge, practices, and perspectives held by Indigenous communities.

This acknowledgment is a first step, we commit to continued listening, deepening our knowledge and practices, and expanding authentic relationships with Tribal Nations and Indigenous Communities in the coming years.

This report was developed on Lenape land, also known as Philadelphia.



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# 1. Introduction



The Clean Water Act (CWA), passed in 1972, is well known for establishing pollution limits that resulted in a historic cleanup of America's waterways. Less well known than the regulatory mechanisms of the CWA, but no less critical, is the Clean Water State Revolving Fund (CWSRF), established to finance implementation of the Clean Water Act. The Drinking Water State Revolving Fund (DWSRF) was established afterward to finance implementation of the Safe Drinking Water Act.

The Delaware River Watershed includes portions of New York, Pennsylvania, New Jersey, and Delaware. Within the Watershed, the State Revolving Funds (SRFs) have financed critical water infrastructure investments and upgrades, from drinking water treatment and distribution to construction of wastewater treatment systems, stormwater management and conveyance, and in recent years, green stormwater infrastructure and control of nonpoint source pollution. These investments have been crucial to ensuring access to basic drinking and wastewater services. They have also reduced pollution to the Delaware River and paved the way for a historic cleanup that has secured drinking water for millions of people and ensured nearby river access for some of the East Coast's largest urban centers.

Although the cleanup driven by these investments has been hugely successful, there are deep disparities among the communities living in the watershed in who has access to clean and affordable water and a healthy environment. According to the Water Affordability Dashboard,<sup>1</sup> which estimates water affordability by census tract using a variety of metrics, water service costs remain a high proportion of total income for many households in the watershed, and

in cities with aging combined sewer infrastructure, wastewater discharges into rivers where people actively fish and boat are still commonplace.

With the passage of the Infrastructure Investment and Jobs Act (IIJA) in 2021, a huge infusion of funding—\$55 billion dollars, in addition to annually appropriated amounts—is now available, via the SRFs, to improve clean water access for communities, with an emphasis on those who need it most. This represents the largest single investment in water ever made by the federal government. Yet despite the magnitude of this investment, the need for infrastructure funding in the Delaware River Watershed and across the country remains significantly greater. To understand how investments might be made during the five-year rollout of the IIJA funding, this report explores current SRF policies, historic investments, and perspective of applicants in the three basin states that contain the largest populations within the watershed: Delaware, Pennsylvania, and New Jersey.

## Study Overview

In 2021 American Rivers, with the Water Center at the University of Pennsylvania (the project team), set out to evaluate how financial assistance has been historically awarded to those that apply to the SRFs within the Delaware River Watershed. The goal of this work was to explore opportunities for more green and equitable investments in water infrastructure, with an emphasis on clean water investments. An advisory panel was engaged to guide the research, consisting of representatives from each of the three SRF programs that are most active in the basin, as well as expert advisors. The panel met quarterly for a duration of 18 months to review findings, share insights, and offer feedback.

<sup>1</sup> Duke University, Nicholas Institute for Energy, Environment, and Sustainability. [Water Affordability Dashboard](#) (website). 2022.

The research was designed to consist of three parts: an analysis of existing policies (Section 3), an overlay of investment and demographic data (Section 4), and case studies (Section 5). In addition, we have summarized conversations and feedback between the project team and the advisory panel (Section 6) and identified key barriers and next steps for advocates and decision-makers (Section 7).

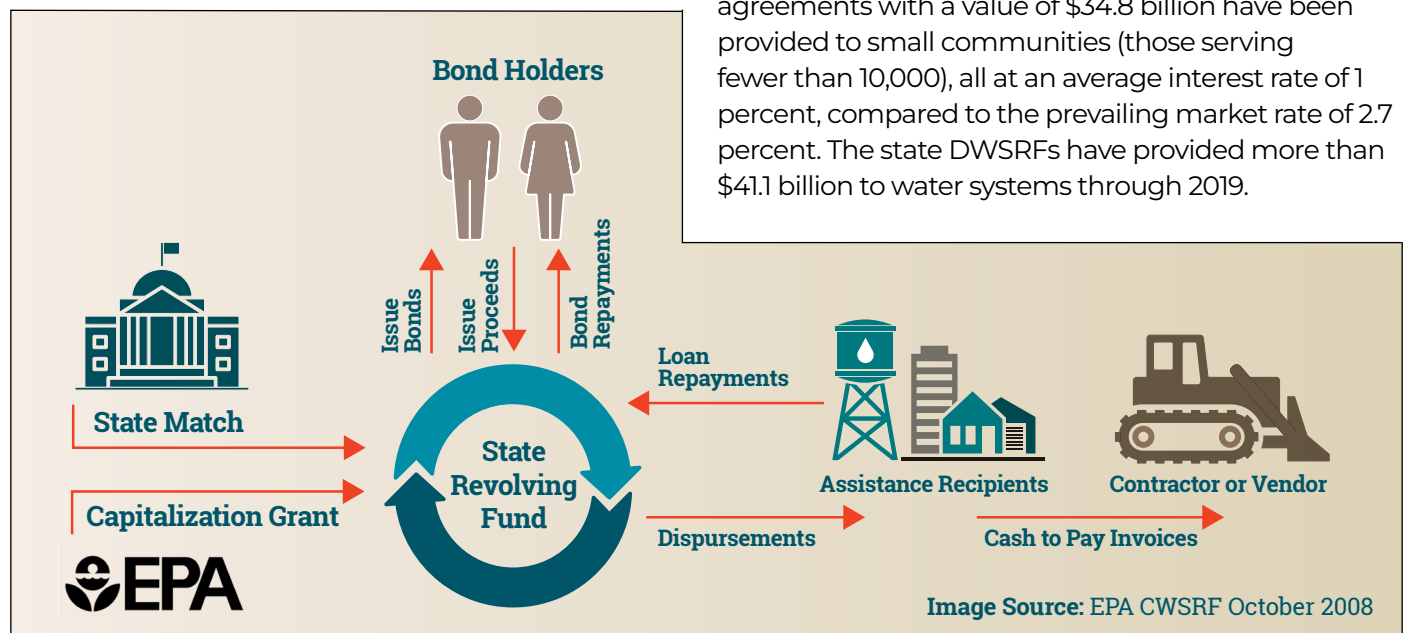
Over the course of the study, three important pieces of legislation were passed that substantially altered the national landscape with regard to water infrastructure investment. The first, the American Rescue Plan Act (early 2021), provided flexible COVID relief funds that could be used (if needed) to fund water infrastructure projects; the second, the IIJA (late 2021), described above, provided an unprecedented infusion to the SRFs and contained provisions to ensure that funds would be directed toward disadvantaged communities; and the third, the Inflation Reduction Act (2022), provided funding for technical support for environmental justice projects in disadvantaged communities. These new programs increase the overall opportunity for investment across the Delaware River Watershed (and nationally), and also highlight the need to understand historic access to SRFs as a way to assess which communities will access funding in the future.

## Background on State Revolving Funds

The CWSRF was created by Congress in the Clean Water Act Amendments of 1987, and the DWSRF was created by amendments to the Safe Drinking Water Act in 1996. Both provide for annual capitalization grants to states, which are awarded to each state based upon the results of the most recent Clean Water and Drinking Water Infrastructure Needs Surveys and Assessments. These grants, along with a 20 percent match from the state, provide below-market interest loans to local communities. Revolving funds provide loans and other authorized assistance to borrowers for eligible infrastructure projects. As borrowers repay their loans, the repayments and interest flow back into the dedicated revolving fund, making funds available for additional loans. The SRF programs within each state can also help to sustain each other by borrowing from one another to meet each state's specific needs. While the U.S. Environmental Protection Agency (EPA) provides guidance and some overarching requirements, each state manages these funds in accordance with their own policies and practices. As a result, each program is a unique reflection of the approach, priorities, and needs of an individual state.

Since their inception, state CWSRFs across the country have provided more than \$153 billion—building on federal investments—through 44,500 agreements to communities. Additionally, 30,100 agreements with a value of \$34.8 billion have been provided to small communities (those serving fewer than 10,000), all at an average interest rate of 1 percent, compared to the prevailing market rate of 2.7 percent. The state DWSRFs have provided more than \$41.1 billion to water systems through 2019.

**Figure 1: SRF Investment Model**



## Definitions of Green Infrastructure and Water Equity

This study uses three lenses to investigate and analyze results: green infrastructure, water equity, and their intersection, equitable green infrastructure. Understanding that many definitions exist for these three terms, below are the definitions that have guided and informed this research.

### Green Infrastructure

According to the United States Environmental Protection Agency (EPA), green infrastructure “filters and absorbs stormwater where it falls.”<sup>2</sup> We use this definition for the purposes of this study and interpret it broadly to include natural landscapes (such as protected forest land), built landscapes (such as tree plantings), and engineered bioinfiltration systems. However, it should be noted that SRF investment records are generally not clear regarding types or function of green elements and often do not clearly separate out the green versus traditional elements of a project. Thus, when reviewing historic spending data, “green” investments were broadly defined as any data records that included green elements as defined above.

### Water Equity

According to the US Water Alliance, “Water equity occurs when all communities have access to safe, clean, affordable drinking water and wastewater services; share in the economic, social, and environmental benefits of water systems; and are resilient in the face of floods, drought, and other climate risks.”<sup>3</sup> A key environmental benefit of water systems is access to clean rivers, which have cultural as well as recreational value that is often not well articulated in the regulatory language of water policy decision-making. Unfortunately, the dominant utility/ratepayer services model of providing clean water

can in some cases amplify deep, racially correlated disparities in access to drinking water, sanitation, and/or healthy rivers.<sup>4,5</sup> The IJIA and other new federal initiatives have created a once-in-a-generation opportunity to supplement this ratepayer model by offering additional subsidy for investment in critical water infrastructure in communities that need it most, thereby partially reversing decades of underinvestment in marginalized communities. This report grounds our understanding of water equity in the US Water Alliance definition, highlighting environmental benefits in particular and acknowledging that communities must have a role in decision-making around clean water investments.

### Equitable Green Infrastructure

Many existing definitions of equitable green infrastructure are process-based and refer to the methods used by governments to prioritize, site, construct, and maintain green projects within communities. For example, a 2022 report<sup>6</sup> by the Cary Institute of Ecosystem Studies defines equitable green infrastructure in three parts: first, with regard to community engagement and power in the planning process; second, with regard to supporting larger goals of justice for historically oppressed communities; and third, with regard to secondary benefits and hazards of the project to the local community.

For the purposes of this report, our understanding of equitable green infrastructure is grounded by three facts: that many marginalized communities (especially in cities) have less access to the benefits of natural systems, including their potential to mitigate the impacts of climate change; that investments in green infrastructure can begin to reverse this gap; and that the communities most affected must have a role in decision-making with regard to green investments. ■

<sup>2</sup> US Environmental Protection Agency. What Is Green Infrastructure? (website): <https://www.epa.gov/green-infrastructure/what-green-infrastructure>. Accessed December 2022.

<sup>3</sup> US Water Alliance. *An Equitable Water Future*. 2017.

<sup>4</sup> NRDC and Environmental Policy & Innovation Center. *A Fairer Funding Stream: How Reforming the Clean Water State Revolving Fund Can Equitably Improve Water Infrastructure across the Country*. 2022.

<sup>5</sup> University of Michigan and Environmental Policy & Innovation Center. *Drinking Water Equity: Analysis and Recommendations for the Allocation of the State Revolving Funds*. 2022.

<sup>6</sup> Cary Institute. *Is Green Infrastructure a Universal Good?* 2022.

## 2. Potential Barriers to SRF Access for Environmental Justice Communities



Many communities with a great deal of need for water infrastructure investments may never access that assistance, and according to recent reports, race-based disparities in SRF funding access have been identified at the national level.<sup>4,5</sup> Broadly, the following questions are relevant with regard to environmental justice communities and barriers to access (special thanks to Andy Kricun of Moonshot Missions for sharing the below insights). These provide a useful framing for the research and next steps outlined in the following sections of this report:

### 1. Have they been alerted to the opportunities?

Environmental justice communities may not be networked in the same way that the larger, more resourced communities are. They may not belong to the water associations, go to as many conferences, etc., as those with more resources. So, it is important to optimize outreach to reach non-networked communities.

### 2. Has the value of the program been clearly articulated?

Some utility leaders may not recognize the full financial benefits of the SRFs. i.e., that the low interest rate and the longer payback periods result in significantly lower annual debt service payments. So, a corollary to the outreach described above would also involve making sure that environmental justice communities know about the program and its value, and have the tools needed to compare long-term costs of private versus public financing.

### 3. Do they have the technical resources to identify the capital infrastructure solution to their problem?

A community may know about the SRF program and understand its value but may not have the staffing capacity to identify

the technical solution to their problem. This is, obviously, where technical assistance providers can be very helpful. It may be necessary, however, for agencies (the EPA and the State Departments of Environmental Protection) to work together to identify the communities that need help and proactively bring the help to them. For example, some of the new screening tools, like EJ Screen, are working to find the confluence of (1) environmental noncompliance, (2) low income, and (3) disproportionate burden to identify the communities that have problems and need help. The tools may be used to funnel these communities to the technical assistance providers.

### 4. Do they have the capacity to get TO and THROUGH the SRF program?

Once a solution has been identified, the next step would be to ensure that they have the capacity to go through the planning, design, permitting, and application processes needed to procure the SRF funding. Technical assistance providers can be very helpful.

### 5. Do they have the cash flow to undertake the planning and design needed to develop the biddable contract documents needed to obtain SRF funding for the project?

For example, New Jersey has a planning and design grant program that does provide for the funding of these costs, which then can be rolled over into the SRF construction loan. Otherwise, some lower-income communities may lack the funds to undertake the planning and design needed to unlock the construction funding.

### 6. Do they have the capacity to implement the selected SRF-funded project?

Many SRF loans include funding for construction management and design engineering services, along with

construction funds. This is critical and may require detailed scoping and additional procurement to ensure that construction projects are managed effectively.

**7. Will they have the operations and maintenance capacity to use the new systems and equipment once the SRF project has been completed?**

Some solutions could include:

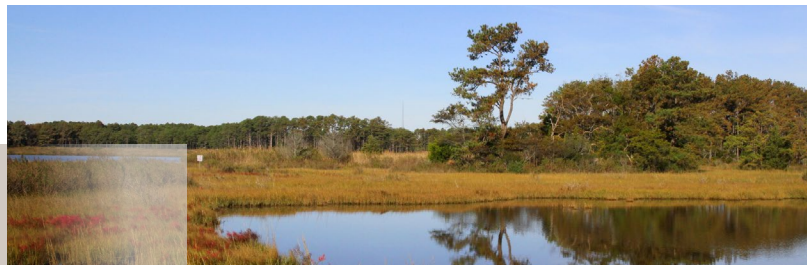
- a.** Encouraging technical assistance providers to prioritize lower-maintenance solutions and also automation where possible, thereby reducing the reliance on post-construction O+M capacity.
- b.** Ensuring that construction deliverables include a strong and clear operations and maintenance plan and training assistance.
- c.** Directing EJ communities to operations assistance resources, such as RCAP and Rural Waters, where applicable.

**8. What options exist for communities who are at their debt service cap and cannot borrow any funds, no matter how attractive the rate?** Some suggestions include:

- a.** It may be possible to help environmental justice communities refinance their existing debt, especially if some of it is older SRF debt. One possibility is to consider increasing the payback period for longer-life capital, such as water mains and sewer lines, which often have a useful life of 80-100 years.
- b.** Perhaps there could be a way to increase debt service caps if the community (with assistance) can show that the annual operations and maintenance savings from a SRF project would be greater than the increase in debt service so that, even though the annual debt service would be increased, the total net annual obligations would be decreased. ■



# 3. Overview of Programs and Policies



In early 2022, the project team reviewed, summarized, and analyzed the policies, practices, and results of the CWSRFs and DWSRFs for the states of Delaware, New Jersey, and Pennsylvania within the Delaware River Basin. The results of this effort, summarized below, are presented in full in [Appendix A: Program Overview and Analysis](#).

Delaware, New Jersey, and Pennsylvania all allocate SRF management responsibilities differently between agency staff and independent public financing authorities. New Jersey and Pennsylvania

delegate major responsibilities for SRF management to such authorities, whereas Delaware, by far the smallest of the three, does not. In order to be eligible to receive the SRF grant, each state is required by the EPA to develop an Intended Use Plan (IUP) annually that includes a Project Priority List that outlines the programs' activities and projects anticipated for the upcoming fiscal year.

Managing agencies for each of the three states, as well as population and land area served by the programs, are described in Table 1.

**Table 1: State Summaries**

State	Total state population	Total state area	Total state area in Delaware Basin	% of basin total area	Managing agency/agencies
Delaware	1M	2,488 square miles	970 square miles	8%	Delaware Department of Natural Resources and Environmental Control & Clean Water Infrastructure Advisory Council
New Jersey	9M	8,721 square miles	2,877 square miles	23%	New Jersey Infrastructure Bank and New Jersey Department of Environmental Protection
Pennsylvania	12M	46,055 square miles	6,280 square miles	49%	Pennsylvania Infrastructure Investment Authority and Pennsylvania Department of Environmental Protection

To better understand how each state invests in SRF projects, it is important to understand the program features that are similar. Each year, the federal government allocates funding toward the state SRF programs in the form of a “federal capitalization grant” plus a 604(b) allotment. The 604(b) allotment, referring to the section in the Clean Water Act where it is codified, is 1 percent of each state’s CWSRF allotment to carry out planning activities. These amounts are then matched by the state at a rate of 20 percent of the amount given. These two sources of income into the SRF programs create new funding to be invested each year along with any funds rolled over from previous years or accrued from interest.

At times, the federal government makes special uses of the SRF programs to deliver other/additional water infrastructure funding to state and local governments; for example, through the American Recovery and Reinvestment Act (ARRA) of 2009. Most recently, the IIJA legislation of 2021 made an unprecedented investment in the SRF programs. Table 2 outlines 2022 budgets for Delaware, New Jersey, and Pennsylvania, including base capitalization and supplemental grants for both CWSRF and DWSRF programs.

### Innovation Highlight: Nontraditional Green Projects in Pennsylvania

Through its nonpoint program, PENNVEST accepts and is able to accommodate requests for innovative green infrastructure projects from nontraditional borrowers. For example, PENNVEST provided \$2 million in CWSRF grant assistance to the Delaware Valley Regional Planning Commission address nonpoint source pollution using green infrastructure. Similarly, PENNVEST made a \$7.9 million investment in the Partnership for the Delaware Estuary’s construction and start-up of a hatchery to propagate freshwater mussels for clean water projects at Bartram’s Garden in Philadelphia.

**Table 2: SRF Program Budgets, 2022**

	Delaware	New Jersey	Pennsylvania
DWSRF Base Capitalization	\$7M	\$12M	\$22M
DWSRF Supplemental (IIJA Funds)	\$54M	\$91M	\$165M
DWSRF Total State Match	\$3M	\$5M	\$10M
CWSRF Base Capitalization	\$6M	\$47M	\$46M
CWSRF Green Project Reserve (10% base)	\$0.6M	\$4.7M	\$4.6M
CWSRF Supplemental (IIJA Funds)	\$10M	\$76M	\$75M
CWSRF Total State Match	\$2M	\$16M	\$16M
604(b) Total Base and Supplemental	\$0.2M	\$1M	\$1M
<b>TOTAL</b>	<b>\$82M</b>	<b>\$248M</b>	<b>\$335M</b>

## Project Prioritization

Each state uses a unique set of prioritization criteria to rank DWSRF and CWSRF applications and develop Project Priority Lists to receive funding. DWSRF and CWSRF projects are ranked and scored separately. Some states further split out the CWSRF Project Priority Lists by category (for example, in Pennsylvania, the CWSRF comprises separate lists for wastewater, stormwater, and nonpoint source projects). Public health and water quality are common prioritization criteria across all three states, while other criteria are state-specific (e.g., New Jersey uses total population as a prioritization factor for CWSRF projects, while Delaware provides priority points for projects that incorporate land conservation). See [Appendix A](#) for a complete listing of prioritization and ranking criteria for each state.

Additional subsidy is the total amount of subsidy (or “free money”) a state must provide as part of the award packages to applicants each EPA grant cycle. This varies from year to year and can manifest in the form of a grant, principal forgiveness, extended loan terms, or negative interest. Principal forgiveness works much like a grant and is the most common form of subsidy in the SRFs. However, rather than receive an upfront payment, the applicant is awarded a loan for the full cost of the project and a portion of the loan is forgiven upon loan closing. This can create challenges for applicants who may not qualify for a loan or who face barriers in developing construction-ready capital projects. Historically, additional subsidy was a relatively small percentage of the total capitalization grant as required by the EPA. But, beginning in 2021, 49 percent of the new IJA funding must be granted as additional subsidy to state-defined “disadvantaged communities”—this represents a significant change in process for state SRF programs and requires a new level of attention to processes to ensure this funding is distributed fairly and in accordance with IJA guidance.

In Delaware, New Jersey, and Pennsylvania, additional subsidy is assigned primarily as principal forgiveness on loans to projects after the complete application is accepted. For the DWSRFs, eligibility is determined by disadvantaged status, which is based on affordability criteria. For the CWSRFs, each state has historically

used a different set of qualification criteria, which are outlined in [Appendix A](#); however, since the completion of this policy assessment in early 2022, all three states have updated their CWSRF criteria to align more closely with IJA guidelines (see below, Affordability Criteria).

## Affordability Criteria

The SRF programs address water equity through the lens of affordability (refer to [Appendix D](#) for details on the affordability criteria used by the three watershed states). The DWSRF specifically has regulatory enforcement built into the law that is meant to assist “disadvantaged communities.” Disadvantaged communities are defined as those that cannot afford their water infrastructure needs; however, this affordability measure is interpreted differently in different states.

Where affordability is generalized across an applicant utility’s service area, it can be difficult to accurately characterize the affordability concerns of the most economically vulnerable populations. For example,

### **Innovation Highlight: Low-Income Household Water Assistance (LIHWAP) in New Jersey**

Though not housed specifically within the SRF program, New Jersey’s version of the federal LIHWAP program deserves special attention because of its ability to complement other water affordability measures. It is funded by the federal Department of Health and Human Services through the American Rescue Plan.

The NJ LIHWAP program has about \$20 million in federal COVID-19 relief funds to assist low- and moderate-income households with unpaid water and sewer bills, in order to help them pay off debt and avoid water shutoffs or tax lien sales on their homes.

Up to \$2,500 is available per eligible household, paid directly by the state to the customer’s water/sewer utility.

large metro regions tend to have significant income inequality concentrated within a single utility service area, and so traditional means of estimating affordability—for example, the use of Median Household Income (MHI) as a metric—may misrepresent the actual affordability of rates for the lowest earners (this misrepresentation is also true for the highest earners).

In 2022, the EPA issued guidance directing states to increase investments in disadvantaged communities (via IJA supplemental funds) and highlighted the need to ensure full enforcement of the Civil Rights Act in distribution of these funds.<sup>7</sup> States were directed to re-evaluate disadvantaged community criteria as well as affordability criteria and to make modifications as necessary—moving away from MHI-

based definitions as feasible.<sup>8</sup> Since then, Delaware, New Jersey, and Pennsylvania have all updated their disadvantaged community definitions and affordability criteria as follows:

- Delaware updated definitions to include multiple metrics beyond MHI and to ensure that disadvantaged communities are eligible for principal forgiveness for both drinking water and clean water projects.
- New Jersey updated definitions to include multiple metrics beyond MHI and to provide opportunities for census-block level affordability assessment (where feasible).
- Pennsylvania updated its affordability criteria so that design and engineering projects use the population of the system that is directly impacted in determining affordability, whereas construction projects utilize all users of the system in determining affordability.

For additional detail on disadvantaged community definitions and affordability metrics, as well as EPA guidance on the matter, refer to [Appendix A](#).

## Technical Assistance

A variety of technical assistance programs are being developed or are currently available to support communities in planning for and developing SRF applications. These programs are described below.

### PENNVEST Technical Assistance Program

In response to the increased funding provided by the IJA, PENNVEST has a contract in place with a technical assistance provider to support small, rural, and disadvantaged systems that generally lack the capacity to plan, develop, and implement clean water projects. Assistance is expected to roll out starting in 2023 to identified systems. In addition, PENNVEST offers engineering services through the DWSRF program (administered by the Pennsylvania Department of Environmental Protection).

### Innovation Highlight: Fee-Funded Grant Programs in Delaware

When SRF loans are made, they are repaid with interest and, in some states, administrative fees that are not subject to the federal SRF requirements. In Delaware, these fees go into a “non-fed admin account” managed by DNREC Environmental Finance and are available to fund several grantmaking programs. Those administered by DNREC’s Nonpoint Source Pollution Program as part of the CWSRF include Community Water Quality Improvement Grants (CWQIG), Surface Water Matching Planning Grants, Wastewater Matching Planning Grants, and Asset Management Grants. On the DWSRF side are two administered by Delaware Health and Social Services: Drinking Water Matching Planning Grants and Asset Management Grants. Of these, CWQIGs are particularly aimed at green infrastructure projects undertaken by nonprofit organizations to advance innovative solutions for water quality improvement. CWQIGs are up to \$75,000 and require little if any match.

<sup>7</sup> EPA. [Bipartisan Infrastructure Law Fact Sheet: State Revolving Funds Implementation Memorandum](#). March 2022

<sup>8</sup> EPA. [Implementation of the Clean Water and Drinking Water State Revolving Fund Provisions of the Bipartisan Infrastructure Law](#). March 2022.



## PENNVEST Center for Water Quality Excellence

The Center for Water Quality Excellence (CWQE) is a support center that helps landowners, local governments, businesses, and organizations navigate the world of funding opportunities in urban and agricultural stormwater management. By providing clarity and guidance on grants, loans, incentives, and public-private partnerships, the goal is to accelerate the implementation of stormwater management practices in order to reduce nutrient and sediment pollution of our streams and rivers. The audience for support includes farmers, businesses, municipalities, and institutions, as well as organizations and agencies that offer financial and technical assistance at the local level. The Center is a pilot program operating in Lancaster and York. During the pilot phase, only those located in Lancaster and York counties can request personalized assistance; however, the online Support Hub's library of resources can be accessed by the general public.

## NJDEP Technical Assistance

NJDEP offers a technical assistance program to support applicants in developing projects and navigating Water Bank processes and requirements. The program is focused on supporting:

- Systems serving disadvantaged communities with lead challenges, PFAS, and safe drinking water compliance issues, combined sewer overflows, sewer infrastructure rehab and upgrades, and more.
- Systems that may lack sufficient resources to perform full assessment of needs.
- Systems that may lack financial, managerial, and/or community support for infrastructure projects and require assistance with stakeholder outreach and engagement.
- Systems that may not be aware of funding opportunities or lack familiarity and comfort with navigating Water Bank program application processes.
- Systems that may need eventual engineering services to assist with planning and design.

Assistance can take the form of Water Bank program navigation support, assistance in understanding fiscal needs, support for stakeholder outreach, and engineering services for planning and design.

To apply for technical assistance, interested parties can complete an online Technical Assistance Request Form: <https://www.nj.gov/dep/wiip/request.html>.

## Delaware Basin Funding Navigator

The Delaware Basin Funding Navigator is a partnership of the Environmental Policy and Innovation Center, the Delaware Valley Regional Planning Commission, New Jersey Future, and others. The purpose of the Navigator is to reach overburdened communities and provide technical assistance to local governments, utilities, and nongovernmental organizations to help them access federal SRF and other public funds for water infrastructure. The Navigator aims to make sure the technical assistance work results in better drinking water, wastewater, and stormwater projects that support equity and resilience in overburdened communities. This means financing projects that are financially sustainable, climate-resilient, and build community trust. The Navigator team works with eligible applicants to plan, develop projects, and apply to programs to access funds, facilitating efficient handoffs between applicants and technical assistance and professional service providers during each step of the process. The Navigator provides seed funds from philanthropic and other sources to support service providers' work and community-based organizations' participation.

## University of Delaware Grant Assistance Program

Offered through the Biden School of Public Policy's Institute for Public Administration, the Grant Assistance Program is a state-funded initiative that provides free technical grant assistance to local governments for infrastructure initiatives and other competitive and formula grant opportunities.

While the program works with all local governments in Delaware, outreach and support are especially focused on local governments that typically lack the

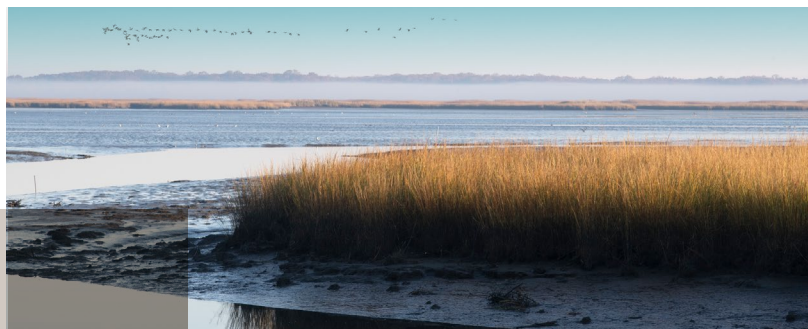
resources and capacity to compete for large-scale infrastructure funding opportunities, including rural or underserved communities.

The program works with local government representatives and other relevant partners to identify potential projects, find funding opportunities, and compete for grants.

### University of Maryland Environmental Finance Center

The University of Maryland Environmental Finance Center will be leading a “Clean and Healthy Water Coalition” composed of skilled technical service providers with expertise in environmental justice, community engagement, social science, water

resource engineering and project management, funding, finance, partnership building, and technical training. The Coalition will deliver training, capacity building, funding application assistance, and engineering support to communities throughout EPA Region 3 with the goal of helping underresourced, overburdened municipalities, tribes, and water utilities access federal and state funding, including IJA funding, for projects addressing clean and drinking water needs. Services are anticipated to be available beginning in March of 2023. ■



## 4. Analysis of 2009-2021 Investments

Through analysis of historic spending and demographics over the past decade, the project team sought to understand what types of communities have accessed and benefitted from SRF funding over the past decade and to what extent these investments supported green infrastructure projects and/or took the form of grants, principal forgiveness, or some other form of affordability assistance.

Using federal data for the period of 2009-2021, CWSRF and DWSRF awards within the Delaware River Watershed were tabulated by total investment (overall and per capita), principal forgiveness (overall and per capita), and total green investment. Data were sourced primarily from the National Information Management System, which the EPA uses to collect annual data on SRF commitments from states. Although the project team originally attempted to use state-level data, it could not be obtained in a consistent format from all three states. Refer to [Appendix B](#) for additional information on methodology.

### DWSRF Analysis And Findings

Investment award data were obtained for each drinking water system in the watershed. Unfortunately, details on total funding amount and additional subsidy for each award could not be obtained, thus the analysis was limited to the binary question of which systems accessed funds and which did not. Demographic profiles were considered for each drinking water system, and a Center for Disease Control (CDC) Social Vulnerability Index (SVI) score was applied to each. For maps of drinking water systems with the SVI score applied, refer to [Appendix B](#). The following key findings were notable:

- Only 9 percent of drinking water systems (70 out of 806) in the watershed accessed DWSRF investment. Notably, however, among that 9 percent of systems were included some of the largest systems in the basin, with the largest populations served.

- Forty-three percent of those that accessed DWSRF investment were classified as somewhat socially vulnerable (88 percent of awards in Pennsylvania, 67 percent of awards in Delaware, and 22 percent of awards in New Jersey).
- Fifty-two percent of those that did not access DWSRF investment were classified as socially vulnerable (57 percent in Pennsylvania, 41 percent in New Jersey, and 30 percent in Delaware).

These results indicate that there are significant differences across states in how socially vulnerable water systems access DWSRF funding. In Pennsylvania and Delaware, socially vulnerable systems represented a large percentage of the total award pool (by number of awards), while in New Jersey, the percentage of total awards to vulnerable systems (by number) was much lower. Across all three states, a large number of socially vulnerable water systems did not access DWSRF funds.

## CWSRF Analysis and Findings

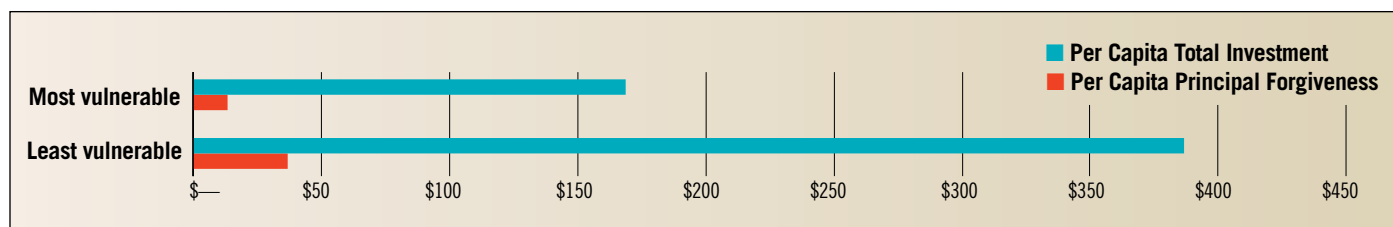
Investment data, including total amount, principal forgiveness, and project categories, were obtained for each CWSRF award. This allowed for a deeper analysis of investments; however, there were challenges in obtaining the necessary spatial data to associate each investment with a wastewater service area. Thus, investments were grouped by county and category (green and traditional), and SVI scores were applied at the county level. For additional methodology and county-level information, refer to [Appendix B](#).

Summaries of investments (overall and green) are presented for each state in Table 3. Per capita spending is compared for the most vulnerable counties (upper 50th percentile of SVI scores) and the least vulnerable counties (lower 50th percentile of SVI scores) in Figure 2.

**Table 3: Summary of CWSRF Spending by State, 2009-2021**

		Total Investment	Avg Per Capita Total Investment	Total Green Investment	Total Principal Forgiveness	Avg. Per Capita Principal Forgiveness
PA	Most vulnerable counties (SVI 3-6)	\$63,760,456	\$45	\$10,582,606	\$8,505,404	\$8
	Least vulnerable counties (SVI 0-3)	\$451,721,370	\$140	\$27,254,138	\$26,431,087	\$8
NJ	Most vulnerable counties (SVI 2-3)	\$116,510,936	\$217	—	\$13,113,605	\$23
	Least vulnerable counties (SVI 0-1)	\$961,470,013	\$383	\$21,380,291	\$92,967,050	\$33
DE	Most vulnerable counties (SVI 2-3)	\$173,529,941	\$246	\$33,744,900	\$4,523,387	\$11
	Least vulnerable counties (SVI 01)	\$143,085,762	\$638	\$5,765,447	\$15,639,678	\$70

**Figure 2: Per Capita CWSRF Total Investment and Principal Forgiveness**



Results of this analysis suggest a watershed-wide trend: that the more socially vulnerable counties have, in general, accessed less CWSRF investment both in terms of total investment and principal forgiveness, both overall and per capita, than the less socially vulnerable counties. In all three states, the counties that accessed both the largest overall investment and the largest amount of principal forgiveness were counties with a very low social vulnerability score. Philadelphia County, the only county that is also a city, had the highest social vulnerability score of all counties assessed and notably ranked 15th out of 16 in Pennsylvania counties in the watershed in terms of principal forgiveness per capita. This assessment did not attempt to characterize actual need, nor did it characterize the vulnerability status of water systems that chose not to apply for funds.

Green investments within the CWSRF were a fairly small fraction of overall investments (between 2 and 12 percent in each state). In Pennsylvania and New Jersey, the majority of applications and awards were made by and for the least vulnerable half of counties. This finding is somewhat surprising given that a large number of green investments in the watershed have been made to address Combined Sewer Overflows (CSOs), which tend to occur in highly vulnerable urban communities. In Delaware, the majority of green investments were made in the most vulnerable counties. These findings must be understood in the context of the county-level analysis and related data gaps, which are described in more detail below and may explain the unexpected results in Pennsylvania and New Jersey.

Also notable is the fact that the large majority of completed CWSRF applications received some type of award. This indicates that overall CWSRF access (regardless of additional subsidy) may be largely mediated by the application process. Thus, a first step toward getting more funding to disadvantaged communities would be to get more to apply.

## Limitations and Need for Additional Data

In both the DWSRF and CWSRF data analysis, lack of data was a significant limitation. Neither data set included information on community-level investments or benefits (ideally, this would be tracked and reported at the census tract level). Thus, social vulnerability had to be generalized across geographically adjacent communities.

As noted above, dollar amounts were not consistently available for drinking water investments, thus that analysis was limited to a binary assessment of access/no access regardless of magnitude.

For the CWSRF analysis in particular, generalizing social vulnerability at the county level may be misleading in some cases, especially across urban/suburban communities where there is deep income inequality. For example, the city of Camden, New Jersey, has been a leader in using CWSRF funds for equitable and green investments that have benefitted a highly vulnerable population. The surrounding parts of Camden County are home to a significantly less vulnerable population and have not benefitted from either the CSO reductions or the green projects implemented with the funding (although it is possible they benefitted from rate reductions or control). However, the county-level analysis groups these communities together and shows only that on average, Camden County has a low social vulnerability score and has accessed a high level of SRF investment.

Future investigations or reporting should, if possible, be performed at the level of wastewater service area or ideally, census tract. Collecting, consolidating, and sharing out these data should be a high priority for all agencies and organizations that are interested in transparency and accountability in the SRF programs. ■



# 5. Case Studies



As follow-up to the analyses described in the prior sections, the project team conducted a series of three case studies of CWSRF access and attitudes in the following communities: Wilmington, Delaware; Salem, New Jersey; and Reading, Pennsylvania. Due to capacity constraints, case studies did not include an in-depth analysis of DWSRF access and attitudes. The case study communities were selected based on their perceived need for water infrastructure investment, uneven history of SRF access and/or additional subsidy, and social vulnerability status. Case studies were informed by a mix of email and phone correspondence, survey, and in-person meetings. A detailed report on community profiles and investment needs and history is presented in [Appendix C](#).

## Equitable Access to Water Infrastructure Funding

All three case study communities have applied for and been offered state revolving fund financing. Over the course of the project, all three state CWSRF programs changed their definitions of affordability. Under the new definitions, each one of the communities featured in the case studies would be considered to have water affordability challenges and should be able to access water infrastructure subsidies and/or reduced interest rates. The vast majority of the CWSRF funding is provided and will continue to be provided through loans even with the new influx of nonrevolving subsidies through the IJIA. It is important to understand that for some communities, particularly those with a small rate payer base, debt financing may not ever be a viable option, because distributing the loan burden among a small number of customers results in water bills that may not be affordable. Other kinds of water infrastructure financing, particularly cost share and

grant funding, remain essential for these smaller systems. While consolidation of smaller systems is often suggested as a solution, other alternatives could be explored, such as shared service agreements and cooperative structures that could help meet smaller water systems' financing challenges.

All three communities reported a desire for additional clarity to understand CWSRF opportunities and how best to proceed with determining a path forward. From these conversations, the project team identified the following key information needs:

- Information about how disadvantaged community and affordability criteria are applied for water systems that span communities with a wide range of social vulnerability status and income levels.
- Information about principal forgiveness opportunities associated with IJIA funding (especially prequalification criteria that can help communities make go/no-go decisions to invest time in seeking funding).
- Information about different funding opportunities available for phases of the project lifecycle that are not traditionally covered by SRFs (e.g., planning; operations and maintenance).

Further discussion of these needs are provided in [Appendix C](#). Advocacy and technical assistance opportunities are highlighted in the Next Steps section of this report.

## Green Infrastructure Projects

Of the three communities, only Wilmington used SRF funding for a green infrastructure project. While the lack of more projects may seem to indicate a problem that needs to be fixed, it is important to understand that many green infrastructure projects do not have large total costs and thus may not be good

candidates for debt financing. In addition, it appears that municipal officials are not as comfortable going into debt for stormwater management as they are for wastewater and drinking water management. Finally, for most non-CSO communities, consideration of green infrastructure projects is tied at least initially to their MS4 permits. The three communities addressed in the case studies have generally been able to comply with their MS4 permits without using

debt financing.<sup>9</sup> Both Delaware and New Jersey have made recent changes to their MS4 permits that may result in greater financing need for green infrastructure projects. ■



## 6. Highlights from Advisory Panel Discussions

Over the 18-month course of the project, the advisory panel met six times to review findings, share insights, and offer feedback. The below represent key themes that were highlighted over the course of the conversations.

### Magnitude of Needed Investment

Despite the historic level of investment recently made available by the federal government, the overall need for water infrastructure upgrades, both nationwide and in the Delaware River Watershed, is far, far greater than can be satisfied by recent infusions of funding. Costs of CSO cleanup alone can be on the order of several billion dollars per utility. IJA funding should be viewed as a “down payment” on this need that can, if implemented carefully, take a first step toward reversing decades of public and private disinvestment in disadvantaged communities.

### Distribution of Additional Subsidy

Additional subsidy and how it is distributed was a recurring theme in panel discussions over the course of the project. Members of the project team highlighted three key challenges in using the current loan-based process for distributing additional subsidy:

- There is a significant cost to developing the necessary technical information utilized in the consideration and evaluation associated with an SRF loan application, and this can be a barrier for disadvantaged communities seeking to access IJA funding.
- Any kind of loan application may not be politically feasible in some cases, even when there is a clear need for investment. This issue, related to perceptions about rate increases, has been cited as a factor in local decisions to privatize water service.
- In the current regulatory environment, there is very little appetite to go into debt for stormwater management or nonpoint source pollution reduction. This makes the prospect of using IJA funding for climate resilience or green infrastructure challenging.

The advisory panel acknowledged these challenges, but some observed that the authorities and functions of the SRFs are not well suited to providing grants in an accessible way. The following were identified as reasons that SRFs should not provide direct grants to applicants:

- Federal grant restrictions place significant burdens on applicants. Some administrators suggested that

<sup>9</sup> The South Wilmington Wetland Park project is referenced in the city of Wilmington’s CSO LTCP.

these restrictions are a bigger barrier to access than the current loan application process.

- Loans allow for a process of sharing additional subsidy across applicants and provide for a long-term sustainable fund for future projects, while grants could tend to concentrate additional subsidy for a few applicants and are considered to be potentially less equitable by some members of the panel. Alternatively, a mix of grants and loans could be shared across applicants, but that would double the applicant's administrative burden.

## Challenges for Green Projects

All three SRF programs in the Delaware River Watershed have invested in green projects, and two of the three states (Delaware and Pennsylvania) have created special application “tracks” to ease the process for nonpoint source pollution projects. Compared to other SRF programs across the country, the three basin states can be seen in many ways as leaders on green investment. However, a key challenge for green (and/or many stormwater and nonpoint source) projects is the relative lack of a regulatory driver to justify local investment. As noted above, most utilities and local governments seem hesitant to take on debt for stormwater management or anything without a pressing near-term need. This leaves it to individual utility managers and government staff to seek creative ways to include green, resilient projects in traditional capital budgets (for example, Philadelphia's Green City, Clean Waters plan or the similar approach taken by the Camden County Municipal Utilities Authority). Much needs to be done to truly institutionalize green, climate-resilient investments across the Delaware River Watershed and ensure that these projects are being developed and included in SRF applications, but a key and overarching need is to incorporate stormwater and climate resilience more thoroughly into federal regulatory programs.

## Communication and Engagement

More communication around SRF processes and opportunities was identified by the project team and the panel as a need to raise awareness and increase participation—both key factors in equitable distribution of program funding. Each of the three states is taking a different approach on outreach, and it appears that none are fully formalized at this time. Technical assistance programs (refer to Section 3) are an important element of this; however, there is also a need for broader and more generalized communications about what the SRFs can fund and how.

Although there are annual public comment opportunities associated with publication of each state's Intended Use Plan, local governments and community groups have expressed confusion and general lack of understanding of SRF program policies and practices, and a sense that those affected by decisions may not be aware of them or may not have the capacity to provide input. In addition, congressionally directed funding (i.e., earmarks) that diverts funds from SRFs without any opportunity for public input further limits opportunities to engage those most affected. Given the massive level of both investment and need, it is critical that all levels of government as well as community-based and environmental organizations coordinate on ways to engage more voices in decision-making.

New Jersey piloted a new approach to outreach on Intended Use Plans in 2022, which consisted of a series of public Zoom meetings where administrators shared information on the SRF program and the IJIA, and participants were able to ask questions and offer feedback. The state also used these meetings as an opportunity to solicit written feedback on the Intended Use Plans. Panel members from New Jersey indicated that this approach resulted in helpful feedback that was incorporated into program changes. ■

## Affordability Criteria

Affordability criteria were discussed in the context of how additional subsidy (specifically principal forgiveness) is allocated within the CWSRFs. The historic emphasis by SRFs on affordability as the lens for equity decisions has led in some cases to funding disparities between large water systems, which are in general more affordable to the average ratepayer, and small systems, which are in general less affordable. Overlaid with demographics and environmental inequities across urban vs. rural communities, these disparities need to be carefully considered for environmental justice implications.

Core to the concept of affordability is the idea that a consistent level of water service should be provided to all. However, the regulatory system that drives SRF investments breaks down for both very rural communities that lack access to drinking water and sanitation services and for very urban communities where historic environmental degradation has been largely externalized from the Clean Water Act requirements that directly influence affordability.

As outlined in Section 3, all three of the state SRFs included in this study have recently updated their affordability criteria in ways that seek to reduce disparities. However, further data collection and public reporting on principal forgiveness and census tract-level benefits is needed to identify and communicate which communities are benefitting from investments and to highlight what, if any, additional changes might be necessary.

## Additional Assistance

A central theme that emerged from the panel discussions was the fact that additional assistance is necessary beyond what the SRF programs can provide. This is related to the overall level of need highlighted above, as well as the fact that SRFs are authorized to act in a way that is not broad enough to

address the range of needs. Three specific needs were highlighted:

- **Affordability measures.** The rising cost of water services combined with deepening income inequalities in large service areas highlights the need for affordability assistance programs. A temporary federal measure (the Low Income Household Water Assistance Program) was authorized as part of COVID-19 response funding, but it is set to expire in 2023. New Jersey has established a similar program at the state level using leftover funding from the American Rescue Plan Act. The city of Philadelphia established a permanent water bill assistance program in 2017. While challenges remain with promoting these programs and enrolling customers, they represent a critical means to address wealth disparities among ratepayers.
- **Grant programs for green projects and CSO cleanup.** As discussed previously, there are limited incentives for utility and municipal leaders to debt finance green projects. Additionally, CSO cleanup projects may face significant challenges accessing principal forgiveness funding in some states due to affordability metrics. A dedicated grant program designed to serve disadvantaged communities would be helpful to fill this gap.
- **Assistance for operations and maintenance.** Panel members identified operations and maintenance as a key challenge for utilities as well as SRF programs (which are not authorized to fund maintenance activities). Overall, there appears to be a general need to better incorporate these activities into long-term utility planning. In addition, there is a sense that more routine investment in maintenance would be helpful to save money and smooth rate increases over time. However, funding for these activities cannot be provided under the current structure of the federal SRF program. ■



# 7. Conclusions and Next Steps



**A**s outlined in this report, the SRF programs in Delaware, New Jersey, and Pennsylvania have played a crucial role in implementing the provisions of the Clean Water Act and Safe Drinking Water Act, serving as a vital source of water infrastructure assistance for communities and rivers across the Delaware River Watershed. With the new infusion of federal funding through the IJA, they will distribute even more assistance in the coming years, and they have already taken preliminary steps to promote equitable access. However, there remain significant barriers to ensuring equity and scaling up investment in green, climate-resilient projects. Some of these barriers are internal to the SRF programs, and some are broader and involve a range of social and environmental challenges.

## Advocacy

Those interested in water equity, climate resilience, and the health of the Delaware River Watershed should consider how advocacy can be used to address the findings of this report. The project team suggests the following as possible next steps:

- Continue to advocate for more funding for water infrastructure—at the federal level, but also within state and local budgets.
- Seek additional state and local forums for engagement around SRF decision-making (especially related to disadvantaged community status and affordability criteria), with attention to creating inclusive spaces for those who have not historically been included.
- Engage a broader coalition of stakeholders in advocacy for clean water and river access, especially related to regulatory decision-making that has the potential to impact water affordability

and provision of environmental services (clean air, clean water).

- Explore and advocate for processes that could allow more additional subsidy to be used for CSO cleanup.
- Learn about the details of each state's SRF program, and advocate for regulatory, administrative, and legislative measures to drive investment in equitable stormwater management and climate resilience, and clean and accessible rivers for everyone.
- Explore legislative opportunities (or modifications to existing programs) at the federal and state level to grow capacity for additional assistance programs for water bill assistance (LIHWAPs), operations and maintenance, green and resilient projects, and CSO cleanup.
- At the state as well as federal level, highlight the need for census tract-level data on project-related benefits—what kind (including green benefits) and to whom—in SRF applications and in routine public reporting by SRF programs.
- Continue to work with utility leaders to mainstream the use of green projects for existing Clean Water Act obligations.
- Support connections between potential applicants and technical assistance providers, and partner as needed to develop simple and accessible information (such as fact sheets) that can be shared with stakeholders.

## Communication and Technical Assistance

Many of the challenges to equity and green investments identified in this report can begin to be addressed through clear, proactive communication

and technical assistance. This could take the form of materials and/or information sessions developed directly by the SRF programs or by the technical assistance providers (consultants, academics, nonprofits) working in coordination with SRF program staff. As highlighted in the preceding chapters, we have identified the following information gaps which, if filled, may encourage disadvantaged communities to apply to the SRF programs:

- Information about how disadvantaged community and affordability criteria are applied for water systems that span communities with a wide range of social vulnerability status and income levels.
- Information about principal forgiveness opportunities associated with IIJA funding (especially prequalification criteria that can help communities make go/no-go decisions to invest time in seeking funding).
- Information about how the Green Project Reserve goals will be fulfilled in each state and any grant/loan prequalifications or special programs available for green projects.
- Information about different funding opportunities available for phases of the project lifecycle that are not traditionally covered by SRFs (e.g., planning; operations and maintenance).
- Consolidated information about the many new technical assistance offerings (state and regional) and how they can support potential applicants in developing, financing, and managing capital projects.
- Information (or tool/calculator) that clearly articulates the financial benefit of SRF loans versus traditional private loans, with project examples and estimates of project lifetime cost savings. ■

# Appendices



**A: [Program Overview and Analysis](#)**

**B: [Investment Data Analysis](#)**

**C: [Case Studies](#)**

**D: [Affordability Criteria](#)**

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