

**CASE STUDY** DECEMBER 2023

# **Resiliency in the Balance: Funding Challenges for Clean Water Utilities in Addressing Climate Adaptation**

## **EXECUTIVE SUMMARY**

Public wastewater and stormwater utilities in the United States are racing to implement much-needed climate adaptation and resiliency initiatives. Clean water agencies are directly impacted by changes in climate patterns, such as increased frequency and intensity of storms, rising sea levels, increased wildfire risk, extreme heat, variations in precipitation patterns, and – for combined drinking water/wastewater utilities in certain parts of the country – increasing threats to reliable drinking water supplies. Ensuring that utilities can quickly adapt to climate-related challenges to safeguard their operations is imperative to protecting public health and the environment. However, securing adequate funding to support these critical climate resiliency programs is not guaranteed.

Member utilities of the National Association of Clean Water Agency (NACWA) are tasked with defending our shared natural resources in the face of changing environmental conditions. This critical work requires long-term planning, strategic investment, and management adaptation. Confronted with extreme weather events and flooding, the threat of rising sea levels at treatment works, and water scarcity in expanding drought-prone areas, many clean water agencies have already proactively undertaken broad-based climate adaptation and resiliency projects in response to unprecedented challenges from rapidly changing climatic conditions.

NACWA members support action on several levels. Relationships among resource consumption, emissions, and opportunities for reuse and reclamation must be carefully considered as utilities build and maintain infrastructure capable of performing reliably in extreme weather conditions.

Despite some narratives to the contrary, many utilities are charging full speed ahead on climate adaptation efforts, aligning behind the [Utility of the Future](#) concept and implementing programs beyond the requirements of the Clean Water Act to serve as leaders in community sustainability and environmental quality. Many others are planning climate and sustainability upgrades but are limited by a lack of resources and federal/state funding opportunities.

**This report looks at funding challenges facing the clean water utility sector in advancing resiliency efforts, while also highlighting stand-out clean water agencies in New York City and Los Angeles County that are innovating and developing regional climate adaptation and resiliency programs in the fields of water reuse, green infrastructure and watershed-based approaches, as well as energy efficiency and clean/renewable energy generation and decarbonization.**

**Some of the key climate adaptation and resiliency strategies discussed in this report include:**

- Infrastructure Upgrades and Retrofits – Improved pump stations and treatment plants, including upgrading pump stations and wastewater treatment plants to withstand extreme weather events and flooding, as well as maintain performance in light of declining dry-weather flows and droughts.
- Green Infrastructure – Incorporating green infrastructure solutions, such as permeable pavement, green roofs, and rain gardens, to manage stormwater and reduce the strain on wastewater systems during heavy rainfall.
- Water Reuse and Recycling – partnering with water supply agencies to develop reuse opportunities for treated wastewater for potable and non-potable purposes, reducing dependence on traditional water sources.
- Converting waste into resources like green energy and nutrient-rich compost.
- Diversification of Water Supplies – Developing alternative water sources to enhance the resilience of the overall water supply system.
- Sensor Networks – Implementing advanced monitoring and early warning systems to monitor weather conditions, water levels, and system performance in real-time.
- Integrated Water Management – Adopting integrated water management approaches that consider the interconnected nature of water resources, including stormwater, drinking water, and wastewater.
- R&D – Investing in research and development to explore innovative technologies and approaches for climate-resilient wastewater management.
- Incorporating Climate Resilience into Regulations – Working with regulatory bodies to integrate climate resilience considerations into wastewater regulations and permitting processes.

By implementing these strategies and others, NACWA members are enhancing their resilience to climate change, reducing vulnerabilities, and improving sustainability for the communities they serve.

## **FUNDING CHALLENGES AND OPPORTUNITIES**

The availability of resources and federal funding for public clean water utilities to build climate-resilient infrastructure can vary significantly depending on factors such as geographic location, local political priorities, and the specific challenges faced by each utility. In general, there are both opportunities and challenges when it comes to funding climate-resilient infrastructure for water utilities. However, some overarching misperceptions about the state of federal water infrastructure funding continue to grow following the passage of the Infrastructure Investment and Jobs Act (IIJA), commonly known as the Bipartisan Infrastructure Law (BIL), signed into law by President Joe Biden in November 2021.

**First and foremost, the water infrastructure funding gap continues to widen each year. According to the American Society of Civil Engineers, the US faces a gap in investment of nearly \$1 trillion (or \$1000 billion) over the next 20 years, compared to the \$55 billion over five years for water appropriated in the BIL.**

Second, high costs and the need to spread limited resources around pose a major funding challenge for climate adaptation and resilience. Building sustainable infrastructure to include technological advancements and engineering projects to include climate-resilient and energy-efficient specifications can involve significant upfront costs. Securing the necessary funding for initial implementation can be a barrier.

In addition, public clean water utilities face financial constraints and often have limited resources to allocate to long-term climate resilience projects. Balancing the need for infrastructure upgrades with other budgetary priorities can be challenging. Clean water utilities must address multiple competing priorities, including aging infrastructure, regulatory compliance, and routine maintenance. Climate resilience projects may face competition for funding with these other critical needs.

Equally important is the lack of standardized funding mechanisms. The absence of these tools, specifically for climate-resilient projects, creates enormous challenges for clean water utilities. Clear and consistent funding mechanisms could facilitate the planning and execution of such projects, but none exist currently.

While many projects are waiting to get off the ground, a mixed bag of funding opportunities for climate-friendly water infrastructure projects does exist. Federal agencies, such as the Environmental Protection Agency (EPA) and, more recently, the Federal Emergency Management Agency (FEMA), provide grant and loan programs that can be used for the planning, design, and implementation of climate-resilient infrastructure, however these programs are limited in size and scope. The August 2022 passage of the Inflation Reduction Act (IRA) also created many new climate resiliency programs across the federal government. While public water utilities are eligible for some of these programs, they must compete with entities in dozens of sectors such as manufacturing, transportation, forestry, and more, and therefore access to funding will be difficult to come by. State and local governments also often allocate funds for water infrastructure projects, and some of these funds may be designated for climate resilience.

**“Clean water utilities can also issue bonds or secure private financing to fund infrastructure projects, and some have been successful in using bonds to raise capital for climate-resilient initiatives. Local governments can also issue municipal bonds to raise capital for infrastructure projects. Investors purchase these bonds, providing the municipality with funds to finance improvements.**

Another source of funding, Public-Private Partnerships (PPPs), utilize collaborative efforts between public water utilities and private sector entities to leverage investment for infrastructure projects. These opportunities often involve design-build-operate-maintain (DBOM) arrangements or other forms of public-private partnerships.

However, the bond market and other sources of private funding are not sufficient to meet the need for climate investment in the clean water sector. And many mid-sized and smaller utilities do not have the resources to access these markets. As such, federal funding is critical. Unfortunately, most existing opportunities for public clean water utilities to access federal funding and other resources for climate-resilient infrastructure are proving to be insufficient to meet the rapidly growing challenges in the water sector associated with climate change and technologies to mitigate these impacts.

As an example, a [cost assessment](#) conducted by NACWA and the Association of Metropolitan Water Agencies in 2009, regarding the operation and maintenance (O&M) adaptations needed to address climate impacts on our nation's water and wastewater utilities through 2050, found that costs to update utilities sufficiently would range between \$123-252 billion. Adjusting for inflation, the O&M costs alone to meet the climate adaptation and resilience needs of the wastewater sector today stands at over \$360 billion.

The American Society of Civil Engineers (ASCE) 2021 national report card, which included 11 categories of infrastructure, gave [wastewater](#) a D+. The ASCE Report states, “As the urgency to make clean water infrastructure more climate resilient increases due to severe weather, these systems will need reliable revenue sources to ensure the built environment is able to adapt with evolving needs.”

“Developing innovative funding approaches, leveraging partnerships, and advancing advocacy efforts for new and sustained federal investment in water infrastructure are needed to help mitigate climate-related challenges. Additionally, policy changes and increased awareness of the importance of climate resilience are needed to guarantee a stronger commitment from Congress in clean water funding for this purpose.”

## **UNCERTAIN POLITICS AND WATER AFFORDABILITY**

Many NACWA members are experiencing uncertainty in funding streams, making it difficult to plan and implement climate adaptation and resiliency projects effectively. This perpetual uncertainty in the clean water sector is exacerbated by changes in political administrations and budget priorities.

As an example, many states operate revolving loan funds that provide low-interest loans to communities for water infrastructure projects. These funds can be used for a variety of purposes, including climate resilience upgrades. Currently, there are serious risks to the water sector from massive, proposed spending cuts to State Revolving Fund (SRF) programs for clean water and drinking water. Of great concern to clean water agencies, the SRF programs previously designated for expansion in FY24 to \$3 billion apiece through the Bipartisan Infrastructure Law are now on the chopping block.

**Instead of trying to fix the nation's rapidly growing water crisis, the House of Representatives recently voted to cut funding by more than half in its Interior, Environment, and Related Agencies Spending Bill. The Senate's version of this bill is slated for a vote early in 2024.**

Specifically, the House Interior, Environment, and Related Agencies bill (H.R. 4821) would cut appropriations for State Revolving Funds to a terminal level, effectively killing these vital programs supporting public clean water utilities. Under this legislation, the Clean Water State Revolving Fund (CWSRF) is reduced from \$1.64 billion in FY23 to \$535 million in FY24 (67% reduction), and the Drinking Water State Revolving Fund (DWSRF) is reduced from \$1.13 billion in FY23 to \$460.61 million in FY24 (59% reduction). The CWSRF figure is only 17% of the authorized level of funding under BIL, and the DWSRF figure only 15%. NACWA has warned that the already underfunded water sector could not absorb additional funding cuts at this level.

NACWA continues to advocate for sustained federal funding to support the public clean water sector in the FY24 Department of the Interior, Environment, and Related Agencies Appropriations Act. When legacy programs such as the SRFs are disrupted and existing funding streams are cut, the responsibility for funding upgrades to clean water agencies for climate adaptation and resiliency falls primarily on the backs of ratepaying households and businesses.

**In the absence of sufficient federal funding, the financial burden to further address climate resiliency for clean water utilities will fall to local ratepayers.**

As federal water infrastructure investment has shrunk in recent decades, ratepayers, or the consumers of water services, are now contributing the lion's share of funding for water infrastructure improvements through water and sewer rates. Increasingly, clean water agencies are in a position of needing to adjust rates to secure revenue for necessary upgrades, including those related to climate resilience.

Collaborative efforts between neighboring municipalities or regions can also pool resources and share the financial burden of climate resilience projects, and these regional partnerships may also be eligible for certain funding opportunities.

Local funding sources, however, are not enough to meet the resiliency demands of the future. Without adequate federal funding, NACWA members in the clean water sector rely on a mix of these funding sources, which often depend on the specific circumstances and priorities of each jurisdiction.

At larger clean water agencies with more robust resources at their disposal, ongoing climate adaptation and resilience projects and others in the planning phase exemplify what is possible when resources are available and funding goals are obtained.

# NACWA MEMBER CLIMATE ADAPTATION AND RESILIENCY PROGRAMS

## CASE STUDIES



### LOS ANGELES COUNTY SANITATION DISTRICTS

In Los Angeles, the Sanitation Districts began recycling water in 1962. Since then, they and their water agency partners have recycled over 1.2 trillion gallons of water. Most of the water from 10 of the agency's 11 wastewater treatment plants is recycled. At the 11th plant, efforts are currently underway to harvest the last untapped source of water as part of the "Pure Water Southern California" Program.

The Pure Water Program is one of the largest water recycling projects in the US. This new water supply will be reliable, drought resistant and reduce reliance on imported Colorado River water, thereby helping several western states in the lower Colorado River basin.

This program is an extensive, multibillion dollar effort where federal funding assistance is vital to keep the resulting water costs affordable. The IJJA created a program that is administered by the US Bureau of Reclamation that is specifically for this type of project, known as the Large-Scale Water Recycling Funding Program, for which \$450 million was appropriated. This funding is essential to help facilitate the development of similar projects, and more funding will be needed as additional projects are developed. Pure Water is now in its environmental planning phase and current plans call for initial delivery of recycled water for some uses by 2030.

In addition to Pure Water, the Sanitation Districts have a program to convert about 450 tons of food waste per day into biogas, which is used to create electricity and transportation fuel. Most of the biogas is used to make the Sanitation Districts' largest treatment facility energy self-sufficient, which helps ensure that it can continuously meet the needs of 3.5 million people.

Producing on-site power makes this facility largely energy self-sufficient and climate-resilient, especially in times of extreme heat, when the California and Western Region electric grid is extremely stressed. Some of the biogas is used to create renewable natural gas that is used as a transportation fuel.

In the future, cleaned biogas will be injected into natural gas pipelines to decarbonize them by reducing the use of fossil fuel-derived natural gas. On top of creating renewable natural gas, this program uses organic waste diverted from landfills, thereby curtailing methane emissions, a potent greenhouse gas (GHG) and short-lived climate pollutant.

Accounting for wastewater and solid waste management activities and other efforts, the Sanitation Districts have been "carbon neutral" as a whole, since 2022. In recent years, the Sanitation Districts have developed other programs and projects to increase climate resiliency and reduce GHG emissions, such as preparation of climate change vulnerability assessments and GHG inventories, and development of a "green fleet" that includes electric light-duty and heavy-duty on-road and off-road vehicles, use of renewable natural gas (RNG) in heavy-duty vehicles and use of renewable diesel.

# NACWA MEMBER CLIMATE ADAPTATION AND RESILIENCY PROGRAMS

## CASE STUDIES



### NEW YORK CITY

Sudden, more powerful storms caused by climate change are bringing intense rainfall to New York City. The effects of such storms are made worse in coastal areas by sea level rise and tidal cycles, and these intensifying storms are overloading the city's sewer capacity. The challenge is only getting worse as oceans and temperatures continue to rise.

The New York City Department of Environmental Protection (DEP) is investing billions of dollars to increase sewer capacity and is also looking toward innovative ways to use "green infrastructure," or nature-based infrastructure, to allow the city to better manage stormwater.

Key elements include Bluebelts, ecologically rich and cost-effective drainage systems that naturally hold stormwater. Bluebelts preserve natural drainage systems using existing streams, ponds, and wetlands, revitalizing and enhancing them to create a natural holding tank. Bluebelts also create natural environments for the local community and wildlife. To date, DEP has completed 94 Bluebelts over 73 acres that successfully manage stormwater drainage across an area of land 70 times that size in Staten Island and Queens. DEP's Bluebelts can manage 443 million gallons of stormwater during a five-year storm, the equivalent of more than 900 Olympic sized swimming pools.

DEP is also creating "Cloudburst" projects in flood-prone communities to store excess stormwater within communities. One of New York City's first Cloudburst project designs involves creating storage tanks under basketball courts to hold stormwater until torrential rains pass and there is sufficient capacity in the sewers to handle the drainage.

Since New York City is limited in areas that naturally soak up rainwater (because so much of the city is paved with materials that are impermeable or nonporous), DEP is also resurfacing streets in flood-prone areas with porous pavement, a special type of roadway designed to absorb and drain rainwater.

DEP is working to gain more access to federal funding from the BIL to ensure New York City can continue to design, construct, and implement these much-needed projects in response to the many challenges posed by climate change. Many federal funds are ultimately distributed by states, and DEP is working to remove any arbitrary caps on federal resiliency funding before the rest of the BIL funds become available.