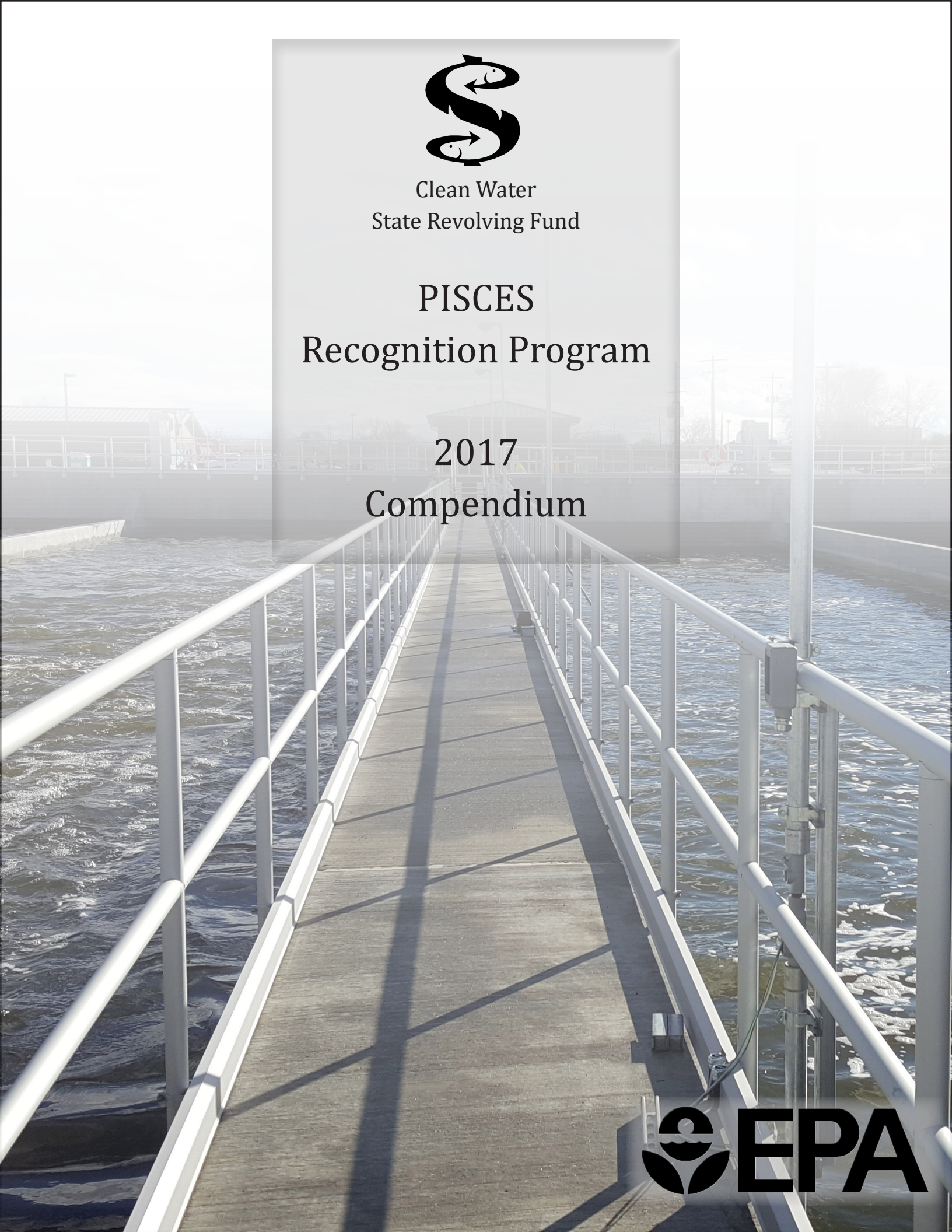

Clean Water
State Revolving Fund

# PISCES
# Recognition Program

## 2017
## Compendium

EPA

# Director's Address

Dear Colleagues,

Each year I am impressed by the many innovative projects financed with the Clean Water State Revolving Fund (CWSRF) that support EPA's mission to protect public health and the environment. These projects bolster our nation's infrastructure and, in turn, generate environmental benefits and improve local economies. There is a great amount of creativity and insight among the 51 CWSRF programs and in the communities they serve. This is demonstrated through the innovative solutions created to provide affordable clean water projects for their communities. I am pleased to announce that the Performance and Innovation in the SRF Creating Environmental Success (PISCES) program has returned to the Office of Wastewater Management so that we can recognize the great work CWSRF assistance recipients and state programs put into creating quality CWSRF projects.

From projects that include the world's largest phosphorus recovery facility to local programs that assist homeowners with replacing failing sewer service lines, this year's PISCES projects demonstrate how varied the CWSRF eligibilities are. Seeing how assistance recipients continue to explore project eligibilities is a testament to the CWSRF's potential for meeting the country's diverse clean water needs. So many communities have employed creative strategies to address their wastewater treatment needs while using the CWSRF, and it is important that this work gets recognized. This Compendium highlights the projects selected by each participating state, and we are proud to showcase the innovation that represents why the CWSRF continues to be a successful and prominent financing program in the wastewater infrastructure sector.

I want to express my sincere appreciation to all PISCES participants. We had a great response and received an excellent selection of projects as described in this Compendium. Thank you!

Sincerely,

Andrew Sawyers, Ph.D., Director
Office of Wastewater Management

# Recognizing Success

The Clean Water State Revolving Fund's Performance and Innovation in the SRF Creating Environmental Success (PISCES) program allows assistance recipients to gain national recognition for exceptional projects funded by the CWSRF. Participating state programs each nominated one project that demonstrates one or more of the evaluation criteria:

- Water Quality, Public Health, or Economic Benefits
- Sustainability
- Innovation

Projects eligible for recognition may be any size but must have an executed assistance agreement in place. Also, projects may be operational or in the planning phase. After all project nominations were reviewed, EPA selected five exceptional projects for further recognition. These five projects demonstrated excellence in matching the PISCES criteria and pushed the envelope for being innovative in using the CWSRF to achieve clean water for their communities. Several additional projects closely demonstrated this level of innovation and are recognized as an Honorable Mention.

We hope that you will enjoy learning about this year's PISCES projects in this annual compendium and that they will inspire continued success in the CWSRF.

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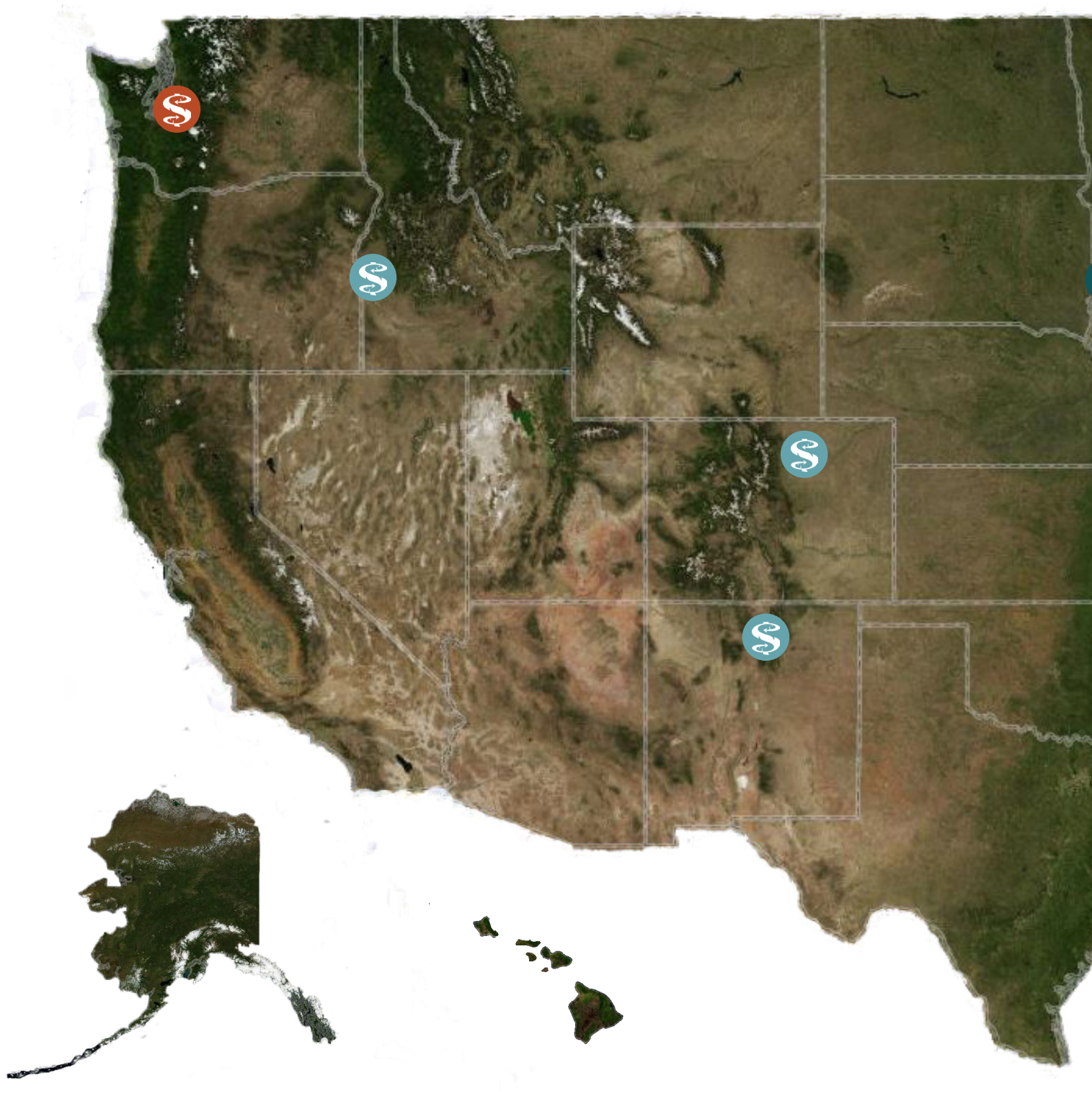
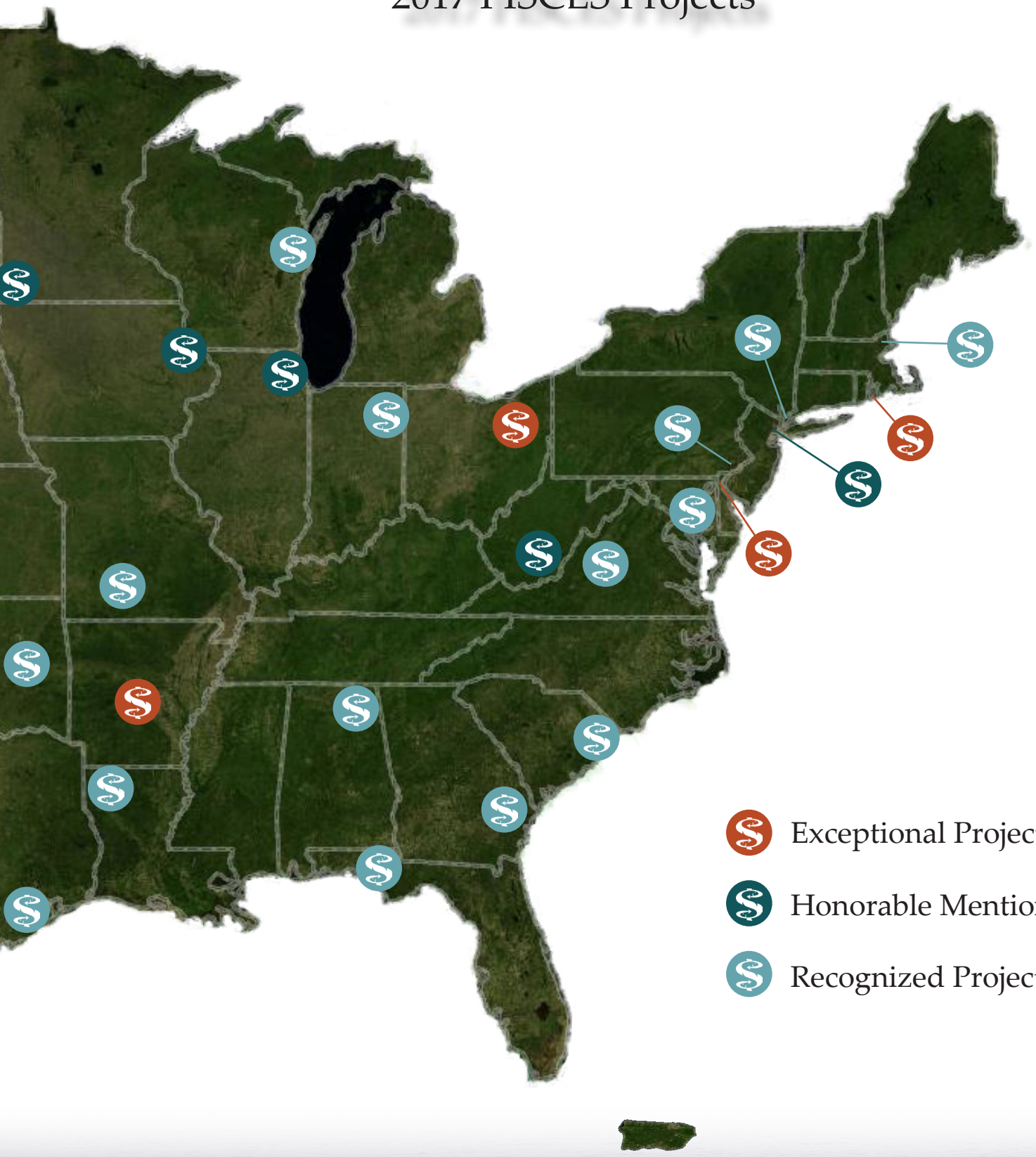


# 2017 PISCES Projects



# 2017 PISCES Projects

**Exceptional Projects**

Arkansas: Sewer Service Line Replacement Program - Little Rock Wastewater Utility
Delaware: Yorklyn Site Wetland Project - Delaware Department of Natural Resources and Environmental Control Parks and Waste & Hazardous Substances
Ohio: Howard Storage Basin-North Hill Separation Project - City of Akron
Rhode Island: Rhode Island Airport Corporation Glycol Recovery System - RI Airport Corporation
Washington: On-Site Sewage System Loan Program - Tacoma-Pierce County Health Department

**Honorable Mentions**

Illinois: Phosphorus Recovery System - MWRD of Greater Chicago
Iowa: Bee Branch Creek Project - City of Dubuque
Minnesota: Implementation of Nonpoint Practices - Rock County
New Jersey: Green Infrastructure Combined Sewer Overflow Initiative - City of Hoboken
West Virginia: Septic Tank Gravity System - New Haven Public Service District

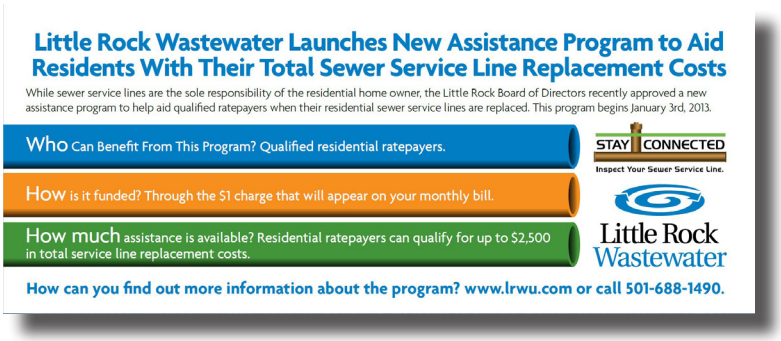
Alabama: Biosolids Improvements for Energy Recovery - City of Albertville
Colorado: Biological Nutrient Removal - Boxelder Sanitation District
Florida: Digester Project - City of Graceville
Georgia: Stormwater Retention - City of Hinesville
Idaho: Wastewater System Consolidation and Upgrade Project - City of Fruitland
Indiana: Three Rivers Protection and Overflow - City of Fort Wayne
Louisiana: Wastewater Reuse Project - Town of Homer
Maryland: Southern Kent Island Sewer Collection System - Queen Anne's County
Massachusetts: Organics to Energy - Greater Lawrence Sanitary District
Missouri: On-site Septic Remediation Program -Upper White River Basin Foundation Inc
New Mexico: Montoyas Arroyo Improvement - Southern Sandoval County Arroyo Flood Control Authority
New York: New Rochelle Wastewater Treatment Plant Upgrades - Westchester County
Oklahoma: Green Infrastructure Project - Oklahoma Conservation Commission
Pennsylvania: Green Infrastructure - City of Philadelphia
South Carolina: 4th Avenue Ocean Outfall - City of Myrtle Beach
Texas: Grand Lakes Reclaimed Water System - North Fort Bend Water Authority
Virginia: Wetland Stormwater Retention System - City of Waynesboro
Wisconsin: New Water R2E2: Resource Recovery & Electric - Green Bay Metropolitan Sewer District

# PISCES Exceptional Project: Arkansas

Program: Arkansas Clean Water Revolving Loan Fund

Assistance Recipient: Little Rock Wastewater Utility

Project Title: Sewer Service Line Replacement Program




The Little Rock Wastewater Utility has been under a Consent Order to reduce inflow and infiltration (I/I) to their collection system to stop manhole overflows. The Utility has spent millions of dollars to rehab the collection system and are starting to hit diminishing returns. As a result, the Utility developed a Sewer Service Line Replacement Program to work on reducing a different source of I/I into the system. The program is designed to assist homeowners in paying for the replacement of the service line from their home to the sewer main. It is an ongoing effort to reduce I/I which will decrease the cost of sanitary sewer collection and treatment as well as the customer's monthly bill. The partial reimbursement program reimburses homeowners up to $2,500 after their service line is replaced by a plumber and inspected by the Utility. The program is funded with a loan from the Arkansas CWSRF combined with a fund created using revenues from a $1 surcharge on each customer's sewer bill.

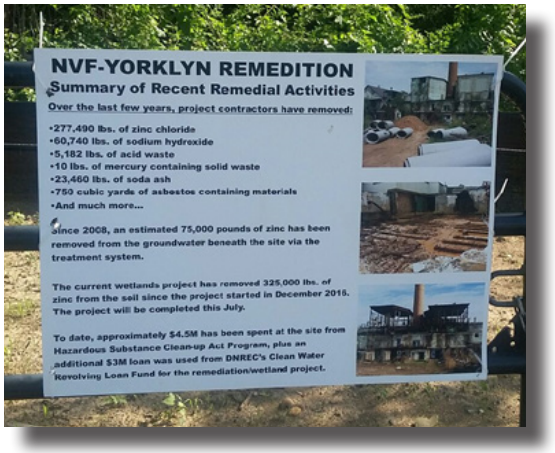
The Utility encouraged homeowners to take advantage of the financial benefit and replace their service line using eye-catching colorful inserts included with sewer bills. The Utility worked with the Arkansas CWSRF program to ensure that the funding source was adaptable enough to work for homeowners. Because CWSRF funds were loaned to the Utility, the innovative reimbursement structure allowed individual homeowners, who are not usually eligible for Arkansas CWSRF assistance, to benefit from the low-interest loan program. The homeowner is responsible for contracting for the work, ensuring that the CWSRF and the Utility do not face the liability of entering a homeowner's property to replace the lines. This project makes innovative use of new CWSRF project eligibilities, allowing the CWSRF to directly assist homeowners with shouldering the burden of replacing the service line from their home to the utility sewer collection system, an activity that was not previously eligible in the CWSRF.

# PISCES Exceptional Project: Delaware

Program: Delaware CWSRF

Assistance Recipient: DNREC Parks and Waste & Hazardous Substances

Project Title: NVF Yorklyn Site Wetland Project




The first of its kind in Delaware, this brownfield to wetlands conversion project will use natural systems to remediate water bodies impaired by decades of industrial activity. The loan will be repaid from Hazardous Substances Control Act (HSCA) tax revenues and is secured by a revenue pledge in the form of a Master-Lease Purchase Agreement with the Department of Natural Resources and Environmental Control (DNREC) as the Lessee and the CWSRF as the Lessor. A memorandum of understanding between the parties gives DNREC the right to withhold HSCA tax revenues to pay annual CWSRF lease payments. This innovative lease-purchase financing structure allows the Division of Waste & Hazardous Substances (WHS) to borrow from the CWSRF without obligating the State to any indebtedness associated with a traditional loan agreement. In addition, the overall project involves a cooperative partnership between multiple state agencies (DNREC-CWSRF, DNREC-WHS, DNREC-Parks and Recreation), the federal government (EPA-Brownfields), and the private sector.

The Delaware CWSRF provided $3.3 million in financing to create 2 acres of wetlands by replacing 29,000 tons of soil contaminated with zinc with clean fill material and topsoil. The wetlands will improve water quality, store stormwater to mitigate flooding, help flush the remaining zinc-impacted groundwater to the recovery trench, and support the economic redevelopment of the Fiber Mills District in Yorklyn. An additional $1 million loan will create a series of additional wetlands around the project site to protect residents and buildings from flooding and runoff. Without the financing and spirit of partnership made possible by the Delaware CWSRF, the remediation of the site was estimated to take another 40 years and cost an additional $10.7 million.

# PISCES Exceptional Project: Ohio

Program: Ohio EPA

Assistance Recipient: City of Akron

Project Title: Howard Storage Basin-North Hill Separation Project

Akron received an innovative financing package from Ohio EPA's Water Pollution Control Loan Fund (WPCLF) program to construct a 2.4 million-gallon concrete storage basin to reduce combined sewer overflows into the Little Cuyahoga River. Akron will borrow $22 million ($13 million at the special 0% rate for combined sewer overflow [CSO] projects) at an overall blended interest rate of 0.93%. In addition to the rate, the other terms of the assistance package demonstrate the flexibility of the CWSRF to enable communities like Akron to make these projects a reality. This is the first CWSRF customer to receive 45-year term financing, which Ohio worked with U.S. EPA to approve earlier this year. In total, this financing package will save Akron approximately $16.9 million compared to financing this project at the market rate of 3.68%. To eliminate any fees or the additional costs of a bonding agent, the WPCLF purchased a bond from Akron and financed a portion of the project costs for the extended term.

The Howard Storage Basin will hold excess flows during periods of high rainfall and release the combined sewage to the sewer system when flows have dropped. Designed to contain the "typical year" event without allowing any overflows to the river, this project will dramatically enhance the water quality in the Little Cuyahoga River. The Basin project is also sponsoring three Water Resources Restoration and Protection (WRRSP) projects (a land purchase, a wetland restoration, and a dam removal), which will discount the entire loan package an additional 0.1%.

# PISCES Exceptional Project: Rhode Island

Program: Rhode Island CWSRF

Assistance Recipient: RI Airport Corporation (RIAC)

Project Title: RIAC Glycol Recovery System

The propylene glycol recovery system at the T.F. Green Airport, in Warwick, Rhode Island, is one of only four de-icer management facilities in the world. Funded with $33 million from the Rhode Island Infrastructure Bank, this world-class approach to capturing contamination from plane de-icing chemicals allows the airport to comply with its Rhode Island Pollutant Discharge Elimination System (RIPDES) permit. The system replaces the previous management technique of using vacuum trucks to capture propylene glycol from catch basins, which was only able to recover 20-30% of the pollutant. The new collection system achieves a laudable 60% collection rate and has been sized to ensure the airport facility can grow and drive economic development.

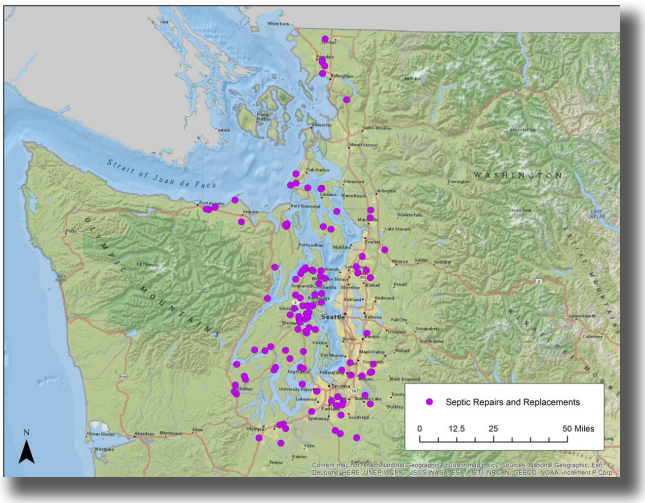
The sophisticated system installed at T.F. Green Airport diverts stormwater runoff to storage tanks, where real-time sensors can detect de-icer contamination and divert, store, and treat the runoff using anaerobic digestion. Leaving no opportunity untouched, the system captures methane produced by the treatment process and uses it to pre-heat the incoming waste stream as well as heat the treatment facility, which reduces operations and maintenance costs by lowering natural gas usage at the facility by 95%. This well-considered process prevents propylene glycol (known for lowering dissolved oxygen in waterbodies) from entering Warwick Pond and Buckeye Brook. Buckeye Brook is undammed and, along with Warwick Pond, serves as a spawning ground for many fish such as alewife and blueback herring that migrate into Narragansett Bay. The project protects the water quality for these fish species essential to the Bay's ecosystem and the local fishing industry, and received accolades from local watershed advocates.

# PISCES Exceptional Project: Washington

Program: Washington Department of Ecology

Assistance Recipient: Tacoma-Pierce County Health Dept

Project Title: Regional On-Site Sewage System Loan Program (RLP)




The RLP consolidates multiple county-level septic loan programs into a single public-private partnership (P3) between the State Dept. of Ecology, State Dept. of Health, multiple counties and local health jurisdictions, and third-party lender Craft3. Ecology contracted with Craft3, a nonprofit Community Development Financial Institution (CDFI), through a competitive procurement process, and created this P3 to administer a revolving loan fund. Funded with SRF loans, Washington State Centennial Clean Water grants, and private funds leveraged by Craft3, the RLP program provides loan assistance to eligible property owners across the region to repair, upgrade, or replace failing or malfunctioning septic systems (or convert to sewers in some cases), protecting public health and water quality. Under this creative arrangement, Craft3 works with local authorities to approve individual projects. Craft3 assumes the financial risk associated with lending and is obligated to repay the SRF funds.

The program leverages economies of scale and Craft3's lending expertise and infrastructure. This makes more funds available for loans, outreach, and education, with less needed for program administration. This allows local governments to reap the benefits of a SRF-funded program while receiving support in managing the local loan program. Low-income borrowers account for 36% of the projects, many of who do not qualify for traditional financing. The new consolidated program streamlines and standardizes the process, making it easier for contractors to work across jurisdictions. Contractors are paid immediately once each system passes inspection. The RLP also lends to small businesses, helping to stabilize local economies.

# Honorable Mentions

Program: Illinois EPA
Recipient: MWRD of Greater Chicago
Project: Phosphorus Recovery System

When the Metropolitan Water Reclamation District of Greater Chicago used CWSRF financing for improvements at their water reclamation plant in Cicero, IL, they not only saved money, they made wastewater treatment history. The project introduced the largest phosphorus recovery system in the world. This new technology harvests phosphorus from wastewater and transforms it into eco-friendly fertilizer, which will divert 1,100 tons of phosphorus each year from the treated discharged to the Mississippi River Basin. The phosphorus recovery facility is a pre-engineered metal building housing fluidized bed reactors, chemical storage, and chemical feed facilities for magnesium and sodium hydroxide. Removing the nutrient and converting it to fertilizer provides cost savings compared with traditional phosphorus removal in terms of lower costs for chemicals, waste disposal, maintenance, and electricity.

Program: Iowa SRF
Recipient: City of Dubuque
Project: Bee Branch Creek Project

The Bee Branch Creek project in Dubuque, Iowa is a success story about how a city dealt with an historic neighborhood prone to flooding (with six Presidential Disaster Declarations and $70 million in damage between 1999 and 2011) by replacing one-mile of storm sewer with a creek and floodplain. This daylighting of the creek will not only allow stormwater from flash floods to safely move through the area (protecting more than 1,000 properties), but will also restore aquatic habitat by allowing sunlight to foster the growth of the microorganisms needed to sustain fish. The design includes riffles, runs, a cobble creek bed, submerged boulders, and permeable pavement for nearby streets. The project proved its worth in 2017, when a heavy thunderstorm caused minimal flooding compared to a similar storm in 2002 which resulted in more than $11 million in damage. Nearly half the project's $60 million cost came from the CWSRF (including $6 million principal forgiveness), and the city paid for the rest with financing from six other state and federal programs and municipal stormwater utility fees.

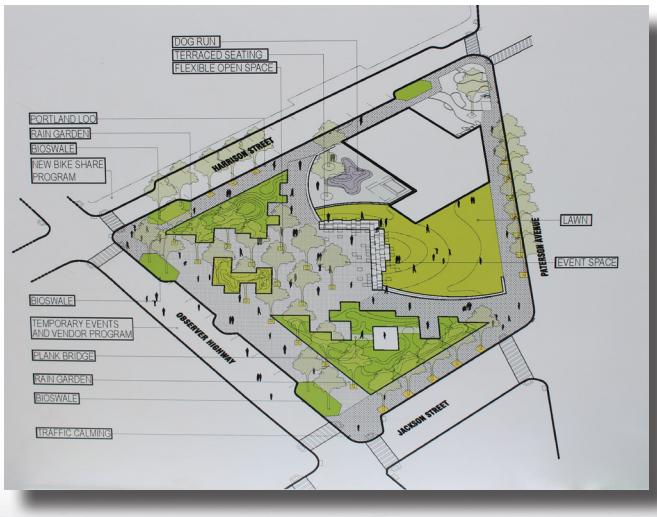
# Honorable Mentions

Program: Minnesota CWSRF
Recipient: Rock County
Project: Implementation of Nonpoint Practices

The Rock County Land Management Office has been a standout local government unit when it comes to implementing Minnesota's innovative Agricultural Best Management Practices (AgBMP) Loan Program. In the 20-year history of the program, the County has provided 377 loans worth nearly $8 million for AgBMPs using CWSRF funds, state funds, and other financing sources in order to reduce costs to the multi-generational farms. Dennis Leuthold borrowed $149,000 to address high nitrates in local wells by reconstructing his stockyard for 926 cows. The result of the rancher's environmental stewardship efforts was an immediate drop in nitrate levels well below drinking water standards. Elsewhere in Rock County, the owner of Fluit Farm borrowed $200,000 to purchase a high clearance fertilizer applicator, improving his crop yield while at the same time protecting residents with shallow drinking water wells from nitrate pollution. Demonstrating the spirit of cooperative problem-solving embodied by Rock County, Fluit Farm has also offered to lend the machinery to neighboring farmers.

Program: New Jersey SRF
Recipient: City of Hoboken
Project: Green Infrastructure CSO Initiative

Sporadic flooding is a part of life in the low-lying sections of Hoboken since they are located in the tidal marsh of the Hudson River across from Manhattan. The City also struggles with combined sewer systems overflows; during storm events, the volume of sewage and stormwater overwhelms the system, causing diluted raw sewage to back up into basements and neighborhoods. Hoboken is tackling these problems head-on with a city-wide stormwater management campaign and green infrastructure initiative, featuring two parks designed to better handle stormwater flows. The green features of these parks include underground detention systems, permeable paving, rain gardens, and bioswales to filter and absorb street runoff. Together, these 1-acre and 6-acre park facilities can detain up to 1.2 million gallons of stormwater and slowly release it to the City's sewer system for treatment while providing green space. With a total cost of $37 million, funding for these projects was provided by two different New Jersey agencies, including $4.2 million in low-interest CWSRF financing from the NJ Environmental Infrastructure Financing Program.



# Honorable Mentions

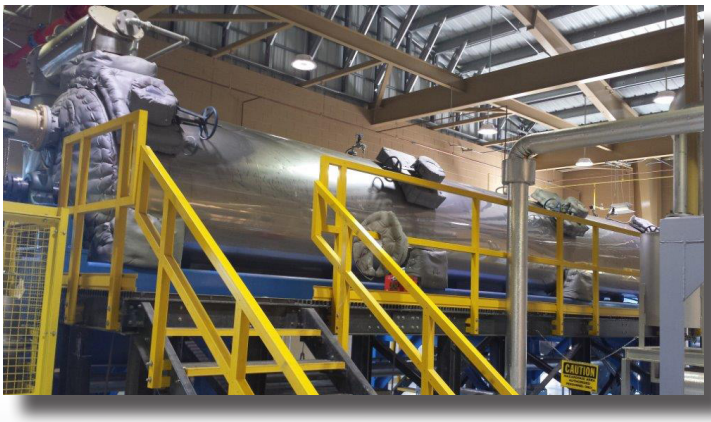
Program: West Virgina CWSRF
Recipient: New Haven - Winona
Project: Septic Tank Gravity System

The community of Winona is a former coal camp of 99 homes and commercial buildings located in Fayette County, West Virginia. Current wastewater disposal practices in Winona consist of direct discharges and failing septic systems that release raw or partially treated wastewater into local ditches, ravines, and streams. Because of this, Keeney Creek, which flows through the center of the community, has the highest frequency of bacteria violations in the New River watershed. This project creates a state-of-the-art decentralized sewer system through a series of distributed high capacity septic systems. The project will treat wastewater using Orenco Advantex technology, which recirculates effluent through sheets of textile filters that last longer and require less maintenance than alternatives. The project combines principal forgiveness from the CWSRF with grant funding from two state agencies to keep the project affordable (under $60 per month) for this low-income community. The flexibility of the CWSRF to provide funding for pre-bid engineering, legal, accounting, and administrative costs was key to making this project a reality.

# Recognized Projects

Program: Alabama SRF
Recipient: City of Albertville
Project: Biosolid Upgrades / Energy Recovery

Biosolids disposal is a costly annual operational expense for the Municipal Utilities Board of Albertville (MUB), which decided to take a proactive approach to reducing the operating costs and improving the overall efficiency of the Albertville Eastside Wastewater Treatment Plant. The MUB received CWSRF assistance to install a new, cutting-edge sludge dryer that produces renewable biosolids for use as agricultural fertilizer while utilizing the biogas formed during the treatment process as fuel to operate the drying system. The utility upgraded the grit and grease removal (at the headworks) and the digester mixing processes to increase biogas production and enable MUB to accept additional grease from septic haulers. This provided the potential for significant amounts of additional biogas fuel. Overall, these improvements afford MUB a long-term, sustainable solution for converting a costly waste (Class B biosolids) into a beneficial by-product (Class A biosolids) while utilizing a renewable, green energy source. The project was funded with a grant from the Tennessee Valley Authority combined with principal forgiveness and a loan from the Alabama CWSRF.




Program: Colorado SRF
Recipient: Boxelder Sanitation District
Project: Biological Nutrient Removal

In 2014, the Boxelder Sanitation District used $11 million in assistance from the Colorado Water Pollution Control Revolving Fund to replace its aerated lagoon system with a new system that will remove ammonia year-round. The new treatment system will help purify discharges into a creek that is 303(d) listed for selenium and E. coli. The project has been one of many success stories showcased by the Colorado Water Quality Control Division's ground-breaking measurable results program. The program captured detailed instream monitoring data between 2011-2015 of the impressive water quality improvements from the new Boxelder treatment plant, including decreases of 95-99% in nutrient levels, 88% in biological oxygen demand, 48% in selenium, and 67% in E. coli. These dramatic improvements have slashed the number of wastewater effluent violations from 19 to 5.

# Recognized Projects

Program: Florida CWSRF
Recipient: City of Graceville
Project: Digester Upgrade

Graceville, a rural community of 2,212 people with a low median household income operates a relatively new treatment plant, but the aeration tank and blowers it uses for sludge processing are old and inefficient. This project will replace the existing blowers with new high efficiency models coupled with a jockey pump that offers an adjustable aeration rate. The level of aeration is determined by an innovative, patent pending process that calculates the rate needed based on real time data supplied by sensors in the digester. Not only will this technology greatly reduce the aeration requirement, but it will also keep phosphorus bound in the sludge so that it is not returned to the headworks. Because the phosphorus will be removed with the sludge, the alum required to remove phosphorus during the treatment process can be greatly reduced. It is anticipated that this project will result in cost savings of more than twice the debt service on the CWSRF loan, allowing the City to make other critical improvements to the system.

Existing Blowers

Program: Georgia SRF
Recipient: City of Hinesville
Project: Stormwater Retention

Hinesville borrowed $4 million from the Georgia CWSRF for a project that hides stormwater storage in plain sight. To improve water quality in 303(d) listed Peacock Creek and other water bodies, a 15 acre lake in the middle of Bryant Commons was retrofitted to retain and treat stormwater from downtown Hinesville. Discharges from the pond are made through a series of cascades, which oxygenates the water. Hinesville is a 300 acre, highly impervious urban area, which experienced localized flooding during past storm events and degraded water quality in Peacock Creek. As a result of this project, total suspended solids deposited in local streams were reduced by 80 percent.

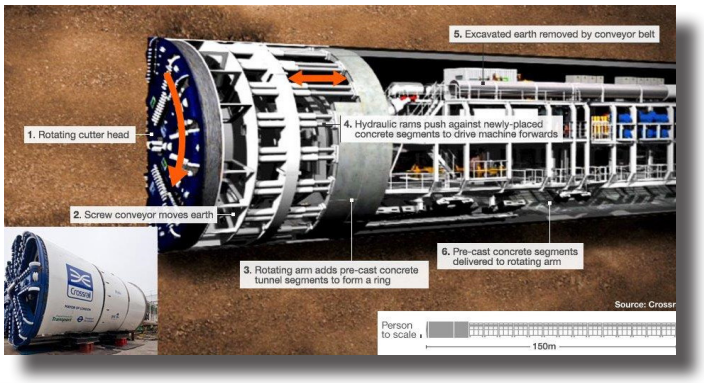
# Recognized Projects

Program: Idaho CWSRF
Recipient: City of Fruitland
Project: Wastewater System Consolidation

Fruitland relied on outdated lagoons to treat their wastewater and struggled to meet permit limits for their discharges to two different 303d-listed streams. This project replaced these failing treatment systems with a single innovative Multi-Stage Activated Biological Process, which allows the City to protect salmon populations in the Snake River. The project eliminates one discharge and removes enough nutrients to meet the permit levels at the other discharge without adding any chemicals. Fruitland coupled these improvements with additional energy saving upgrades, including a new interceptor sewer (consolidating all wastewater flow to the downstream upgraded plant), a high intensity UV disinfection system, and tertiary filtration. Idaho's CWSRF funded half the project and partnered with a variety of local, state, and federal funding sources to fund the rest. The energy efficiency improvements alone will save the small community $300,000 annually, with a similar sum saved from eliminating the need for chemical purchase and byproduct disposal. The City now has a single, combined wastewater treatment facility with a single discharge to a different receiving stream, meeting stringent effluent permit limits.

Program: Indiana CWSRF
Recipient: City of Fort Wayne
Project: Three Rivers Protection and Overflow

Fort Wayne embarked on an ambitious approach to meet a Consent Decree to reduce the volume of combined sewage discharged while providing extra protection against extreme weather events. The Three Rivers Protection and Overflow Reduction Tunnel (3RPORT) was constructed using $188 million in financing from the CWSRF. The highlights of the massive infrastructure project are 5 miles of 16-foot diameter tunnels and 1 mile of 18-foot diameter connection sewers with an expected useful life of 100 years. The cost savings are as out-sized as the underground tunnels: $1.70 per gallon compared to $5 per gallon to retrofit existing stormwater storage. Experts estimated that only a 12-foot diameter tunnel would be necessary to meet the terms of the Consent Decree, but the City decided to widen the tunnel to a 16-foot diameter for the prospect of future rainfall increases and higher than expected stormwater flows. The mega-tunnel offers an additional 18 million gallons of storage, ensuring that this scenic city at the confluence of the Maumee, St. Marys, and St. Joseph rivers will be able to weather the storms to come.



# Recognized Projects

Program: Louisiana CWSRF
Recipient: Town of Homer
Project: Wastewater Reuse

Located in Northern Louisiana near the Arkansas border, the Town of Homer is home to 3,200 people. The Town owns and operates a 1.34 MGD wastewater treatment plant and accompanying collection system and discharges into Bayou D'Arbonne. The Town's assets also include a 43-acre municipal golf course. Using $464,492.50 in CWSRF funds, the Town constructed a 200,000 gallon water tank to hold reclaimed wastewater, which can be delivered through a new force main, for irrigating the golf course. By using the reclaimed wastewater, Homer can reduce its withdrawals from the Sparta aquifer, preserving this source for the fourteen parishes that rely on it for drinking water. Prior to this resource-conserving project being implemented, the aquifer was being drained at an unsustainable pace. In addition to reducing pressure on the aquifer withdrawals, the Town will reduce costs by avoiding withdrawals.


Program: Maryland CWSRF
Recipient: Queen Anne's County
Project: Kent Island Sewer Collection System

Queen Anne's County utilized CWSRF assistance to improve water quality in the Chesapeake Bay by connecting 1,526 properties that had failing septic systems. This $55 million project is partially financed by a $34 million CWSRF loan for disadvantaged communities that includes $1.2 million in loan forgiveness, a low 0.8% interest rate, and a 30-year repayment term. The failing septic systems are generally on small lots with marginal soils and high groundwater. Upgrading Southern Kent Island to sewer service will not only remove 7,000 pounds of nitrogen each year from Chesapeake Bay, but will also benefit the community by improving property values, spurring new development, and making the island more resilient. A combination of revenue streams, including a premium assessed on buildable vacant lots, has enabled the county to keep the project affordable at under $100 per month per customer.

# Recognized Projects

Program: Massachusetts CWSRF
Recipient: Greater Lawrence Sanitary District
Project: Organics to Energy

Massachusetts banned the landfilling of organic materials in 2014, which created an excellent opportunity for wastewater utilities with anaerobic digesters to accept this food waste and use it for energy production. The Greater Lawrence Sanitary District seized this opportunity, using a $24 million CWSRF loan combined with $6 million in grants from state agencies to make improvements to its digester and treatment works. The upgraded facility will be able to accept 92,000 GPD of source separated organics and use this material to generate 3 MW of electricity on-site, reducing its carbon footprint by 3,919 tons per year (the equivalent of taking 840 cars off the road) and furthering its goal of becoming a resilient zero-net-energy facility by 2018.

Program: Missouri CWSRF
Recipient: Upper White River Basin Foundation
Project: On-site Septic Remediation Program

This area of the state has beautiful lakes that drive a thriving tourist industry, but many of the year-round households are low income and constructing on-site septic systems can be costly due to shallow bedrock, steep terrain, and proximity to surface waters. Missouri has awarded $2 million in additional subsidization to a third party organization called the Upper White River Basin Foundation, Inc. also known as Ozarks Water Watch (OWW) to setup a program that provides funding to homeowners to repair or replace failing on-site septic systems. This program empowers local residents to protect their water resources while also generating economic growth. OWW uses the income level of the homeowner to determine the funding package mix of grant money and zero-interest loans. Since 2011, the program has been able to replace or rehab 238 septic systems using $1.5 million from the Missouri CWSRF as well as loan repayments from some of the early septic loans. The program has prevented an estimated 6.7 million gallons of untreated sewage from entering the area's water annually.

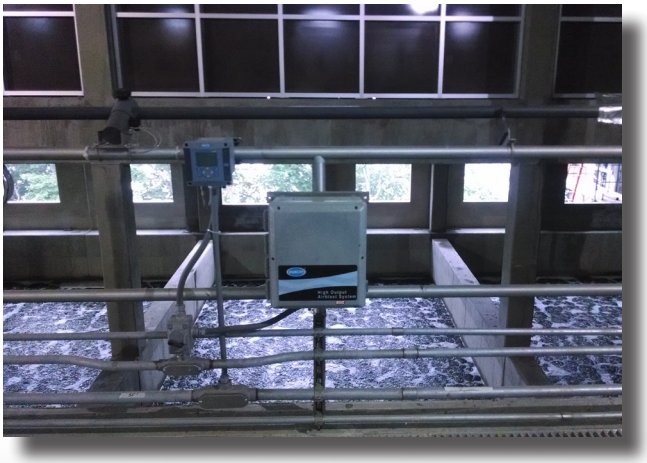
# Recognized Projects

Program: New Mexico CWSRF
Recipient: South Sandoval County
Project: Montoyas Arroyo Improvement

After flooding plagued the Village of Corrales, NM in 2006 and 2013, the Southern Sandoval County Arroyo Flood Control Authority developed a project utilizing innovative green design to enhance the absorption of stormwater to lower the risk of further floods. The core element of the project was a "mechanical phytoremediation" facility designed to use the capacity of plants to capture and filter sediment, floatables, and debris from stormwater and to allow for the absorption of the remaining flow into a permeable surface. This low-impact project preserves the arroyo in its natural state and creates open space with trails for community use. The upper infiltration basin uses natural oxbows for sediment and debris removal, while the lower segment uses a braided channel with an infiltration basis; a series of dry wells in both areas promotes groundwater recharge.

Program: New York CWSRF
Recipient: Westchester County
Project: New Rochelle WWTP Upgrades

Westchester County agreed to a Consent Order in 2004 that required it to upgrade the New Rochelle wastewater treatment plant to meet stringent new discharge limits on total nitrogen, chlorine residuals, and additional suspended solids in order to protect the Long Island Sound Estuary. At the same time, the County needed to expand the plant from 13 MGD to 20.6 MGD to handle peak flow surges during more frequent wet weather events. Accomplishing these upgrades was challenging because the facility is located on a peninsula with little land available for expansion. Therefore, the utility decided to install new innovative tertiary treatment biofilters (which requires less space) and eliminate the use of chlorine by switching to UV disinfection. The net result of this $280 million CWSRF-financed project is a state-of-the-art treatment facility that has met the higher standards since becoming operational in 2015.



# Recognized Projects

Program: Oklahoma CWSRF
Recipient: Oklahoma Conservation Commission
Project: Green Infrastructure

The Oklahoma Conservation Commission (OCC) received CWSRF financial assistance and partnered with other state agencies, municipalities, universities, and non-profit groups to implement diverse projects in disadvantaged communities to protect waterbodies on the state's 303d list, which are significantly impacted by NPS pollution. One innovative arm of the project creates a wetland at Lake Eufaula in which the native vegetation and wetland soils will capture and treat stormwater runoff from a portion of the City of Eufaula. The location will include educational components and recreational opportunities so that residents can learn about the value of wetlands. Another project at Lake McMurtry used project funds to create a parking lot using permeable pavement, which will increase infiltration and reduce pollutant runoff. The final demonstration and educational project funded by the OCC was a bioretention cell for the parking lot at the Grand River Dam Authority's state-of-the-art water quality and research lab. The bioretention cell will capture and treat runoff from the parking lot area at the education center and will be used as part of a tour to educate visitors about the principles of low-impact development and the efforts necessary to protect Grand Lake water quality.

Program: Pennsylvania CWSRF
Recipient: City of Philadelphia
Project: Green Infrastructure

The City of Philadelphia has a combined sewer and stormwater system with 164 permitted outfalls. To minimize and mitigate combined sewer overflows (CSOs), the City borrowed $30 million from PENNVEST to fund its groundbreaking Green City Clean Waters program. Since its launch in 2011, the program has funded 95 different projects and exceeded expectations by reducing stormwater runoff and CSOs by an incredible 1.7 billion gallons a year. This funding model differs from the traditional CWSRF process, which involves completion of planning, design, and bidding before the loan is executed. Under this funding model, new projects are chosen every 6 months, spanning a broad spectrum of green best practices including green roofs, curb bump-outs, rain gardens, permeable payments, wetlands, tree plantings, and stream restoration.

# Recognized Projects

Program: South Carolina CWSRF
Recipient: City of Myrtle Beach
Project: 4th Avenue Ocean Outfall

The City of Myrtle Beach received a $12 million CWSRF loan to eliminate nine outfalls that discharged stormwater directly onto a beach used year-round by millions of visitors. The stormwater from downtown (a densely developed 87 acres of businesses and homes) is now discharged 1,100 feet into the ocean, protecting both public health and environmental quality along the Grand Strand coastline. This iconic stretch of beach has been plagued by elevated levels of enterococcus bacteria, resulting in numerous warning signs and media stories about unsafe water that harmed the critical tourist industry. The State and City expect the new ocean outfall to reduce bacteria levels and eliminate many of the swimming advisory signs. In addition to these critical improvements, another major benefit is the prevention of erosion caused by stormwater discharges at the beach.

Program: Texas CWSRF
Recipient: North Fort Bend Water Authority
Project: Grand Lakes Reclaimed Water System

In the bustling Houston metropolitan area, the North Fork Bend Water Authority (the Authority) has promoted reuse of treated effluent as a resourceful and sustainable source for irrigation of green spaces. After acknowledging significant demand for recycled water, the Authority received $11 million (including $1.6 million in principal forgiveness) in CWSRF assistance for the construction phase of a reuse system that will treat effluent from one wastewater treatment plant to Type I Standards and distribute the water throughout several Grand Lakes Municipal Utility Districts for irrigation of green spaces. The treated water will also help maintain levels in the scenic amenity lakes throughout the Districts. The system is anticipated to replace 0.59 million gallons of potable water use each day with reclaimed water flowing through approximately 52,000 linear feet of purple pipe. The community gains a more cost-effective and sustainable solution to maintaining green spaces and amenity lakes while lowering dependence on groundwater.

# Recognized Projects

Program: Virginia CWSRF
Recipient: City of Waynesboro
Project: Wetland Stormwater Retention

The City of Waynesboro transformed a vacant field containing a small stream and dry detention pond into a wetland stormwater retention system that protects the South River and Chesapeake Bay from polluted run-off. This wetland is a Level 2 design, meaning it removes 75% of incoming phosphorus and 55% of nitrogen loads. The existing stream was re-routed through terraced pools and ponds created in the field, which serve to retain and delay the flow of excess water during rainstorms. Native plants and trees placed on-site help to filter and absorb the phosphorus and nitrogen from the polluted run-off before it moves downstream to the South River and the Chesapeake Bay. Additionally, the City plans to develop a community garden, trails around the ponds, and signs explaining the history of the project to allow residents of the nearby Jefferson Park neighborhood to enjoy the area. Waynesboro funded the $1.7 million project with a loan of $870,376 at 0% interest for 20 years through the Virginia Clean Water State Revolving Loan Fund and a state grant of $861,364 from the Virginia Stormwater Local Assistance Fund.

Program: Wisconsin CWSRF
Recipient: Green Bay
Project: New Water R2E2: Resource Recovery

The Green Bay Metropolitan Sewerage District, known as NEW Water, is using CWSRF financing to implement a project known as Resource Recovery Electrical Energy (R2E2). The R2E2 project values waste as a resource to recover rather than something worthless to dispose. The project will use resource recovery methods to save money, replace its solids handling facility, meet stricter environmental regulations, increase capacity, and replace aging infrastructure. The workhorses of the project are two anaerobic digesters that will break down biodegradable material and capture the methane gas produced to generate electricity, providing approximately half the electricity the utility needs each year and saving $2 million annually. Greenhouse gas emissions are expected to be reduced by about 22,000 metric tons per year, the equivalent to removing about 15,000 vehicles from the road. Another value-added byproduct of the process will be rich fertilizer, which will be sold commercially as another source of revenue. NEW Water will also be able to accept waste streams that they never could before, including food processing waste, diverting more material from landfills and revolutionizing the role of the utility as a multi-faceted environmental service provider.

For more information about the Clean Water State Revolving Fund, please contact us at:

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