Financing Green Stormwater *and* Natural Infrastructure *with* Clean Water State Revolving Funds

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EXECUTIVE SUMMARY

Communities around the country face environmental and health consequences due to failing water infrastructure. The Clean Water State Revolving Fund—a federal program that finances projects to improve water quality and public health—helps address these challenges. States and territories, who administer the funds, have considerable discretion over which projects to finance. Most primarily invest in gray infrastructure. The Clean Water State Revolving Fund has financed more than $140 billion of repairs and upgrades to wastewater treatment plants, sewer pipes, and other projects since 1987.

This report examines Clean Water State Revolving Fund-financed investments in green stormwater infrastructure and natural infrastructure. These nature-based solutions mimic or utilize natural processes to solve water quality and stormwater challenges. Green stormwater infrastructure and natural infrastructure are often cost-effective, climate resilient, and provide economic and social benefits. Congress requires states to invest 10 percent of their Clean Water State Revolving Fund in green infrastructure, water or energy efficiency improvements, or environmentally innovative activities through the Green Project Reserve. While states meet this requirement, most invest more in energy and water efficiency projects than green infrastructure. We specifically evaluate investments in green stormwater infrastructure and natural infrastructure.

From 2016 and 2020, states allocated three percent of Clean Water State Revolving Fund commitments to green stormwater infrastructure and natural infrastructure. The amount of investment increased over this period. Investment in green stormwater infrastructure and natural infrastructure projects varies considerably from state to state. As a percentage of total commitments, Vermont and Delaware financed the most green stormwater infrastructure and natural infrastructure. Twelve states have not financed green stormwater infrastructure and natural infrastructure with program funds in the past 5 years, including several states in the Midwest and Northeast that could use nature-based solutions to address combined sewer overflow challenges.

Both states and the federal government can take several steps to increase investment in green stormwater infrastructure and natural infrastructure. We recommend that states:

- Dedicate more funds for green stormwater infrastructure and natural infrastructure: State agencies should dedicate at least 20 percent of their awards to green stormwater infrastructure and natural infrastructure.
- Hire more staff to expand programs: State agencies should hire more staff to develop, finance, and manage projects with borrowers.
- Provide more technical assistance: Borrowers need more technical assistance to design projects, submit applications, and develop repayment streams.
- Encourage private organizations to build project pipelines: More private entities could utilize the program to finance natural infrastructure projects.
- Leverage to finance more projects: States could spread their resources further by leveraging program funds.
- Establish specific sub-revolving loan funds for natural infrastructure: State agencies should establish specific sub-revolving funds to solicit, prioritize, and finance natural infrastructure projects.

We also recommend that the Environmental Protection Agency:

- Refine definitions and reporting categories: Stronger definitions and reporting categories for green stormwater infrastructure and natural infrastructure will facilitate more consistent conversations and better tracking.
- Dedicate a percentage of Green Project Reserve funds to green stormwater infrastructure and natural infrastructure: A minimum requirement will increase investment in nature-mimicking projects
- Strengthen the Green Project Reserve requirement: States should provide technical assistance and more additional subsidies to incentivize investment.
- Support sponsorship projects: The EPA should report on the number and type of sponsorship projects for green infrastructure and develop materials that support their broader use.

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Acronyms

CSOs	Combined Sewer Overflows
CWA	Clean Water Act
CWSRF	Clean Water State Revolving Fund
FY	Fiscal Year
GPR	Green Project Reserve
GSI	Green Stormwater Infrastructure
NI	Natural Infrastructure
NIMS	National Information Management System
SRF	State Revolving Fund

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1 Quantified Ventures

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INTRODUCTION

Managing water quality and quantity is a challenge in many communities. Climate change, aging wastewater infrastructure, and population shifts contribute to increased pollution and flooding. Addressing these challenges will require significant investments in infrastructure: the EPA estimates needed investment is at least $271 billion nationwide.[2] The environmental and health consequences can be severe when these challenges are not addressed.

The Clean Water State Revolving Fund (CWSRF) program finances projects that improve water quality and public health. The program has played a key role in improving water quality in the United States by financing more than 42,800 projects since 1987. Congress increased the appropriation for the CWSRF program from $1.64 billion in FY 2021 to $2.6 billion by FY 2026 through the Infrastructure Investment and Jobs Act (Infrastructure Act).[3] Within a broad mandate, states have substantial discretion in which projects to finance with these funds.

The Clean Water State Revolving Fund (CWSRF) program finances projects that improve water quality and public health.

2 The EPA's 2012 Needs Survey is the most recent estimate. This number is generally considered an underestimate due to its datedness and lack of regard for investments addressing non-point source issues. EPA. (2016). Clean Watersheds Needs Survey 2012: Report to Congress. Retrieved from https://www.epa.gov/sites/default/files/2015-12/documents/cwns_2012_report_to_congress-508-opt.pdf
Hansen, K., Roberts, S., & Sinha, S. (2022). Unlocking State Revolving Funds to Finance Resilience Across the Great Lakes Region. Retrieved from https://www.risc.solutions/wp-content/uploads/2022/01/Unlocking-SRF-to-Finance-Resilience-Across-the-Great-Lakes-Region.pdf

3 Humphreys, E. H., & Ramseur, J. (2022). Infrastructure Investment and Jobs Act (IJJA): Drinking Water and Wastewater Infrastructure. Retrieved from https://crsreports.congress.gov/product/pdf/R/R46892

In the face of substantial need and increased funding, it is important to understand how states allocate CWSRF funds. Typically, states provide loans to wastewater systems to repair or replace gray infrastructure. But treatment plants, pumps, and pipes may not always be the most prudent investments. Investments in gray infrastructure miss opportunities to cost-effectively use natural processes to address challenges while providing co-benefits to communities.

Green stormwater infrastructure (GSI) and natural infrastructure (NI)—both of which mimic or replicate natural processes—are often cost-effective and resilient solutions to water quality and stormwater challenges. This infrastructure also provides additional economic, environmental, and social benefits.[4] For example, well-planned and well-maintained green and natural infrastructure can decrease flooding, stormwater overflows, and combined sewer overflows (CSOs) as well as reduce pollution in lakes, rivers, and aquifers, thereby making water usable for drinking or recreational purposes.[5][6] It often makes sense for states to finance natural and green infrastructure with CWSRFs to secure these benefits.[7] However, barring policy shifts, we anticipate most funds will continue to finance gray infrastructure, depriving GSI and NI seed financing to become more mainstream.

This report examines CWSRF-financed investments in green stormwater infrastructure and natural infrastructure. We analyze these investments using state data reported through the National Information Management System (NIMS).[8] Specifically, we evaluate investment in GSI and NI as a percentage of total CWSRF commitments nationwide. We also evaluate the variation over time and by state.

4 Luedke, H. (2019). Fact Sheet | Nature as Resilient Infrastructure – An Overview of Nature-Based Solutions. Retrieved from https://www.eesi.org/papers/view/fact-sheet-nature-as-resilient-infrastructure-an-overview-of-nature-based-solutions
5 EPA. (2019). What is Green Infrastructure? Retrieved from https://www.epa.gov/green-infrastructure/what-green-infrastructure
6 Denchak, M. (2019). Green Infrastructure : How to Manage Water in a Sustainable Way. Retrieved from https://www.nrdc.org/stories/green-infrastructure-how-manage-water-sustainable-way#whatis
7 EPA. (2019). What is Green Infrastructure ? Retrieved from https://www.epa.gov/green-infrastructure/what-green-infrastructure
8 EPA. (2018). Clean Water State Revolving Fund (CWSRF) National Information Management System Reports. Retrieved from https://www.epa.gov/cwsrf/clean-water-state-revolving-fund-cwsrf-national-information-management-system-reports

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METHODS: DEFINITIONS AND DATA

Definitions

There are several definitions for green stormwater infrastructure and natural infrastructure. Many use the terms interchangeably to describe the use or mimicking of natural processes to provide ecosystem services. Both GSI and NI control the quantity and quality of stormwater. We make a distinction in this report and define the terms as:

- **Green stormwater infrastructure:** systems or features that use or replicate the functions of the natural environment to store, infiltrate, or evapotranspire stormwater.
- **Natural infrastructure**: intentionally managed or restored natural landscapes or features that store, infiltrate, or evapotranspire water with no or relatively little engineering. NI is a relatively distinct subset of green infrastructure.[9]

We seperate NI, a subset of GSI that relies more on natural landscapes, from GSI writ large. Most GSI is typically more engineered than NI. However, these categories can be hard to distinguish. NI is most distinct as natural landscapes or features, such as wetlands and forests. But natural landscapes and features can include engineered elements, such as permeable pavement or perforated pipes. Some GSI integrate natural and engineered systems, such as rain gardens and green roofs.

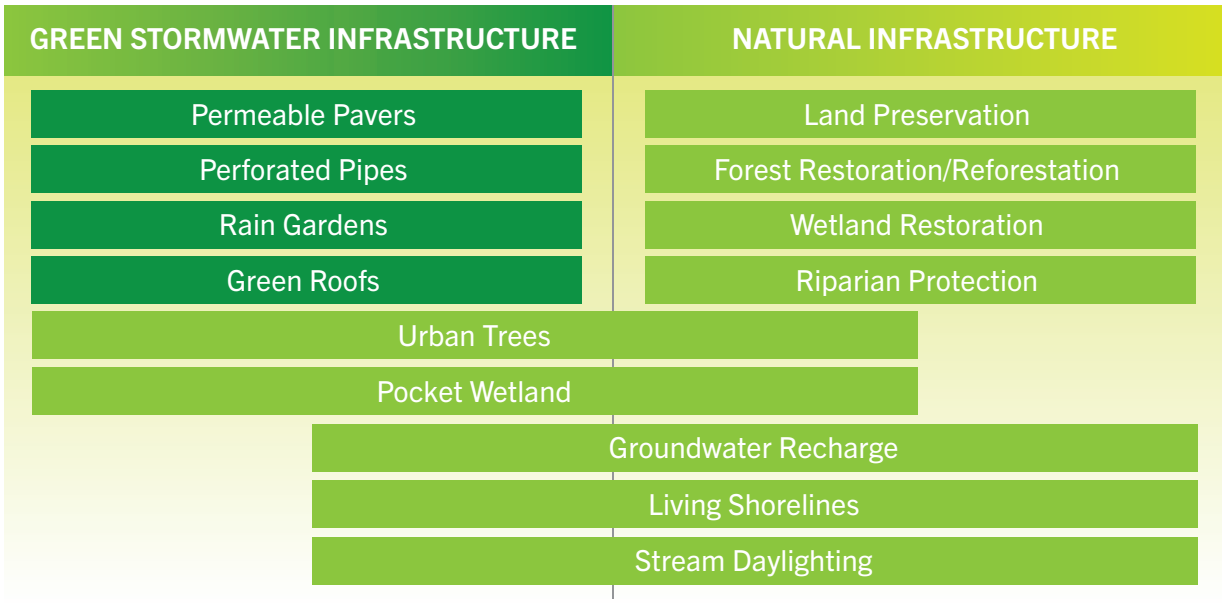


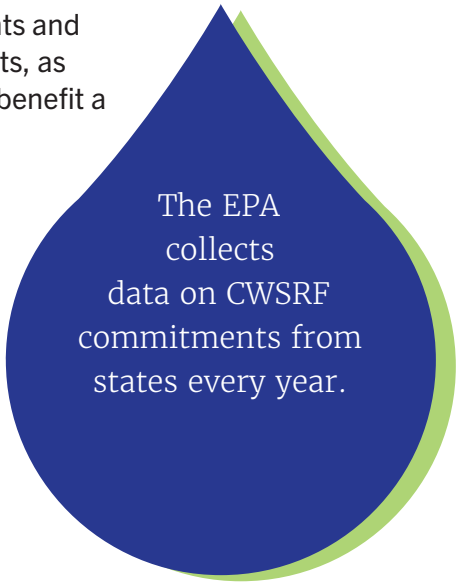
Figure 1. Examples of GSI and NI activities

9 Luedke, H. (2019). Fact Sheet | Nature as Resilient Infrastructure – An Overview of Nature-Based Solutions. Retrieved from https://www.eesi.org/papers/view/fact-sheet-nature-as-resilient-infrastructure-an-overview-of-nature-based-solutions

Data

We analyze the extent to which states use CWSRFs to finance green and natural infrastructure using data from the National Information Management System. The EPA collects data on CWSRF commitments from states every year.[10] The data in this report are primarily from the section on "CWSRF Assistance Provided in Dollars."

NIMS data track spending on categories of projects that are eligible to finance with CWSRFs.[11] The overarching categories correspond with three sections of the Clean Water Act: (1) Section 212 "treatment works" projects, including centralized wastewater treatment plants and stormwater, management projects;[12] (2) Section 319 nonpoint source projects, as described in a state's nonpoint source plan;[13] and Section 320 projects that benefit a National Estuary Program.[14] Appendix A lists all spending categories.



Based on our definitions, we include five NIMS categories. GSI stands alone. NIMS does not track more specific types of GSI projects.[15] For the purposes of this paper, we include Silviculture, Ground Water, Hydromodification/ Habitat Restoration, and Land Conservation as NI. As described above, some NIMS categories do not fall neatly within the NI subcategory. For example, a groundwater recharge basin could be a natural wetland or an intensely modified, pipeline-fed, vegetation-free basin that is almost entirely engineered. Hydromodification is not generally considered to be natural infrastructure but NIMS combines hydromodification and habitat restoration into one category. It is not possible to parse the data. Table 1 shows the line numbers, categories, and explanations of each.[16]

10 EPA. (2018). Clean Water State Revolving Fund (CWSRF) National Information Management System Reports. Retrieved from https://www.epa.gov/cwsrf/clean-water-state-revolving-fund-cwsrf-national-information-management-system-reports

11 The dollar amount of each eligibility category is reported in lines 138-167. EPA. (2017). Clean Water SRF Program Formulas for Calculated Values in Individual State and National Summary Reports. Retrieved from https://www.epa.gov/sites/default/files/2018-03/documents/cwformulas.pdf

12 According to CWA section 212 ""treatment works" means any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature to implement.[. . .] any other method or system for preventing, abating, reducing, storing, treating, separating, or disposing of municipal waste, including stormwater runoff, or industrial waste." See Clean Water Act, 33 U.S.C 1292 (1977). Retrieved from https://www3.epa.gov/npdes/pubs/cwatxt.txt

13 Clean Water Act, 33 U.S.C 1329 (1977). Retrieved from https://www3.epa.gov/npdes/pubs/cwatxt.txt

14 Clean Water Act, 33 U.S.C 1330 (1977). Retrieved from https://www3.epa.gov/npdes/pubs/cwatxt.txt

15 The GSI category "includes a wide array of practices at multiple scales that manage wet weather and that maintain and restore natural hydrology by infiltrating, evapotranspiring and harvesting and using stormwater." See EPA. (2012). 2012 Clean Water State Revolving Fund 10% Green Project Reserve: Guidance for Determining Project Eligibility. Retrieved from https://www.epa.gov/sites/default/files/2015-04/documents/ green_project_reserve_eligibility_guidance.pdf

16 EPA. (2017). Clean Water SRF Program Data Definitions for Individual State and National Summary Reports. Retrieved from https://www.epa.gov/sites/default/files/2018-03/documents/cwdefinitions.pdf

Table 1: NIMS line numbers, categories, and explanations included in the analysis

NIMS line number	Category	Type	Explanation
145.2	Green Stormwater Infrastructure	GSI	Systems, features, or practices that use or replicate functions of the natural environment by infiltrating, evapotranspiring, harvesting and/or using stormwater.
153	Silviculture	NI	This category includes nonpoint source pollution control activities that are related to the management of forests and woodlands
155	Ground Water	NI	This category covers nonpoint source pollution control activities related to ground water protection with the purposes of improving, restoring, or protecting ground water quality and quantity.
161	Hydromodification/Habitat Restoration	NI	This category covers nonpoint source pollution control activities related to habitat protection and restoration. Hydromodification, the alteration of hydrological characteristics, is included because it could include projects like shoreline activities (e.g., swales, filter strips) and instream activities (e.g., fish ladders).
163.1	Land Conservation	NI	This category includes land acquisition to protect water quality. Protecting open spaces and sensitive natural areas can provide places for recreation, preserve areas with important ecological functions, and enhance quality of life

A major source of confusion about whether and how much states invest in green infrastructure is the Green Project Reserve (GPR). Congress created the GPR in 2009 as a requirement to invest in environmental projects that would provide long-term economic benefits.[17] Four categories of projects are eligible: green infrastructure, water efficiency, energy efficiency, or other environmentally innovative activities. Several of these projects would typically not be considered "green" because they are gray infrastructure that do not incorporate or mimic natural processes.[18] Some GPR projects have little impact on water quality. [19] For example, Maryland's GPR financed a thermal hydrolysis bioenergy reactor in 2020.[20] Appendix B provides a more detailed explanation of the differences between the GPR, GSI, and NI.

We analyze the NIMS data to answer three questions:

1. How much GSI and NI do states finance with CWSRFs?
2. How do nationwide investments in GSI and NI vary over time?
3. How do investments in GSI and NI vary by state?

17 EPA. (2012). ARRA Clean Water State Revolving Fund: Green Project Reserve Report. Retrieved from https://www.epa.gov/sites/default/files/2015-04/documents/arra_green_project_reserve_report.pdf

18 EPA. (2015). Green Project Reserve Crosswalk Table. Retrieved from https://www.epa.gov/sites/default/files/2015-04/documents/green_project_reserve-crosswalk-table.pdf

19 EPA. (2021). Green Project Reserve Guidance for the Clean Water State Revolving Fund (CWSRF). Retrieved from https://www.epa.gov/cwsrf/green-project-reserve-guidance-clean-water-state-revolving-fund-cwsrf

20 Simmers, Laura. (2019). Ground Broken For $262m Piscataway WRRF Bio-Energy Project. PC Construction Company. https://www.pcconstruction.com/blog/ground-broken-for-262m-piscataway-wrrf-bio-energy-project/

RESULTS

How much GSI and NI do states finance with CWSRFs?

States provided $36 billion of CWSRF assistance from 2016 to 2020. Most of these funds have financed projects to build and upgrade wastewater treatment plans, sewers, and equipment. Figure 2 shows less than $1.05 billion (2.91%) of total assistance was spent on GSI or NI projects. Engineered GSI investments amount to nearly half of projects between 2016 and 2020. Hydromodification/habitat restoration, silviculture, land conservation, and groundwater projects each account for less than one percent of spending.

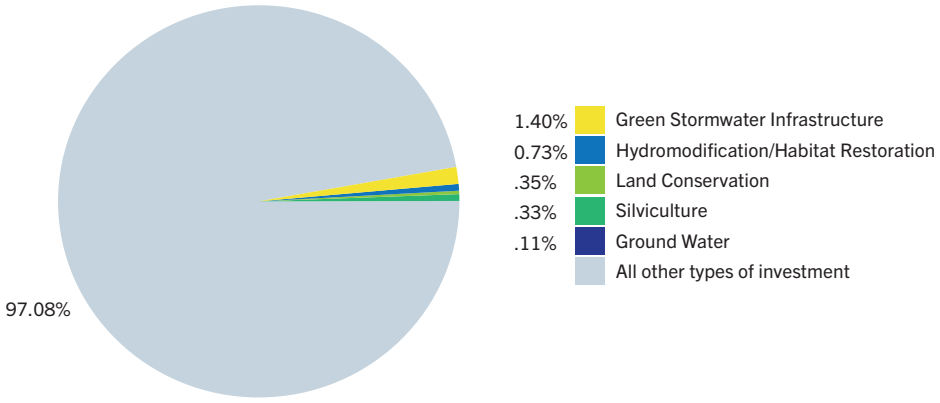


Figure 2: Investment in GSI & NI and all other types of projects, 2016-2020 (data: NIMS)

Variation over time

The amount of CWSRF-financed engineered GSI and NI has increased over time. In 2016, states allocated less than 2 percent of their CWSRF funds to GSI and NI. By 2020, states invested more than 4 percent of their CWSRF funds to such projects. Figure 3 shows engineered GSI investments grew the most over this five-year period.

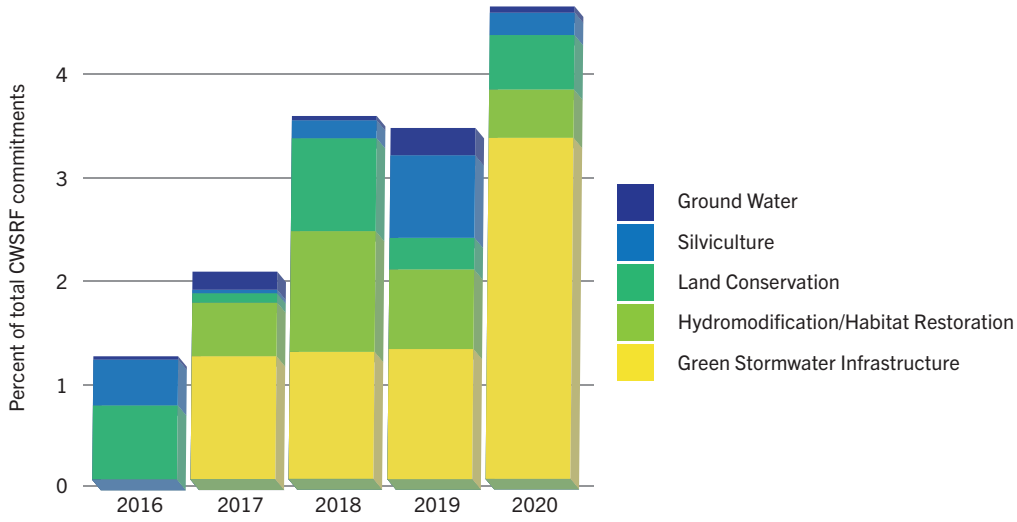


Figure 3: Percent of total CWSRF funds invested in different types of GSI and NI projects from 2016-2020 (data: NIMS).

Variation by state

There is considerable variation in the amount states spend. Figure 4 shows the percent of total CWSRF spent on different types of GSI and NI in each state from 2016 to 2020. As a percentage of total commitments, Vermont and Delaware spent the most on GSI and NI. Twelve states have not spent any CWSRF funds on NI in the past 5 years, including several states in the Midwest and Northeast that struggle with CSOs and could benefit from NI.

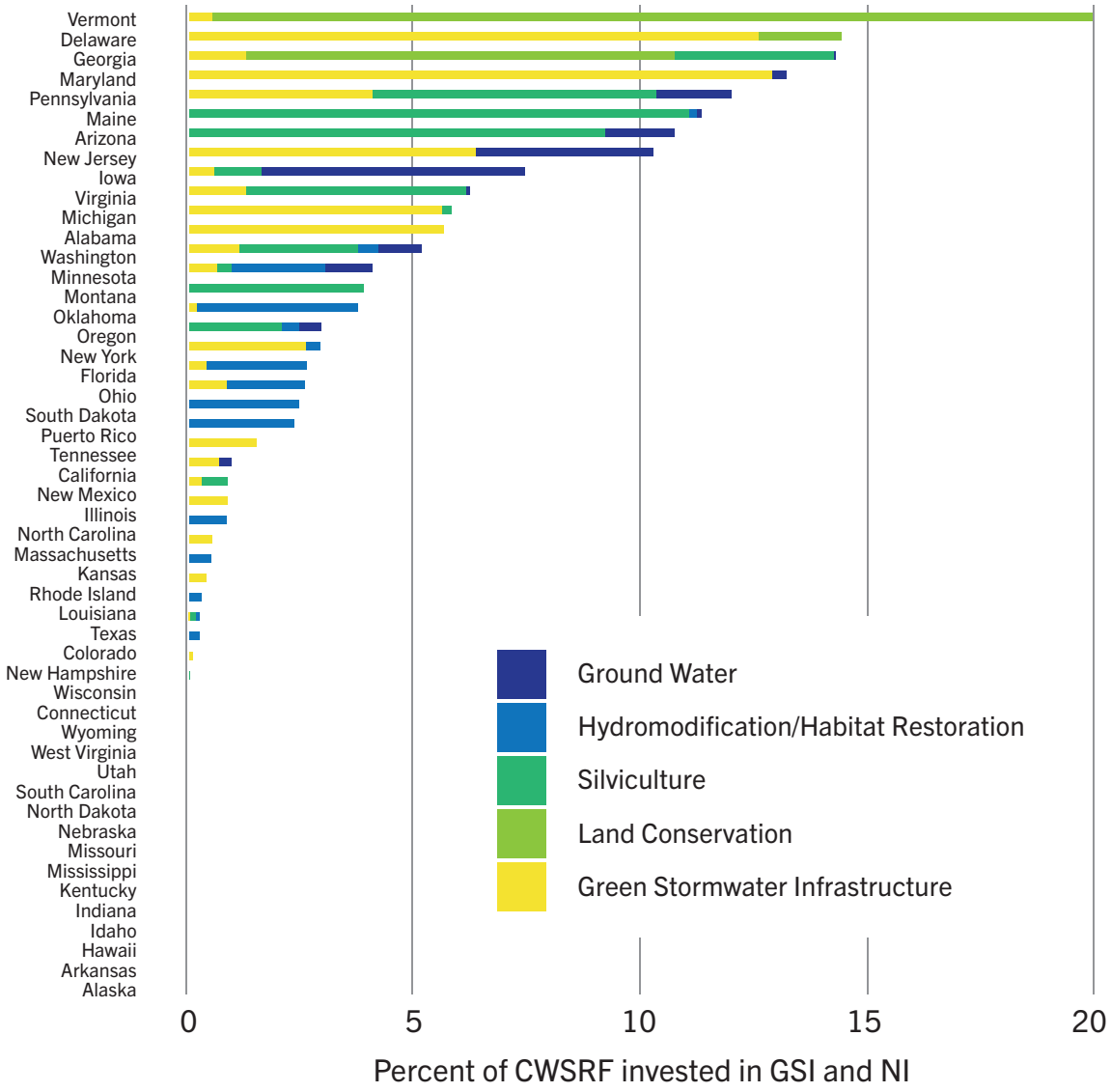


Figure 4: Percent of CWSRF invested in different types of GSI by state, 2016-2020 (data source: NIMS)

POLICY RECOMMENDATIONS

Recommendations for states

› Dedicate at least 20 percent of available funds for GSI and NI

State agencies should dedicate at least 20 percent of their CWSRF awards to GSI and NI. The GPR originally directed states to allocate 20 percent of their capitalization grants towards "green" projects. Several states found it difficult to meet this requirement. However, larger investments in GSI and NI are achievable with additional staff and technical assistance. The increase in appropriations for the program in the Infrastructure Act creates an important opportunity to scale-up to secure valuable co-benefits of GSI and NI, including public health and climate resiliency.

› Hire more staff

CWSRF staffing has remained flat while the volume of awards has increased by more than 25 percent in the past 15 years.[21] State agencies must dedicate more resources to coordinate with borrowers and other agencies. SRFs cannot be expected to allocate funds to achieve new goals while maintaining current levels of service without additional staffing.

› Provide more technical assistance

Many CWSRF programs would welcome GSI and NI projects but receive few applications from borrowers. Many borrowers seeking to finance GSI and NI, such as conservation groups, are likely eligible for support but may not understand the program very well. To address this gap, state agencies need to connect with potential borrowers and provide technical assistance to help.

› Encourage private organizations to build project pipelines

Private for- and non-profit organizations can help build a pipeline of GSI and NI projects. These entities could turn to CWSRFs to catalyze their work. CWSRFs could be particularly helpful in providing interim financing and front-loading for NI projects. NI projects often involve some form of land acquisition, such as land for conservation or wetland restoration. Organizations often only have a short period of time to make the acquisition when properties become available. Many financing agreements take between two and five years to finalize. The lag can lead to an inability to complete the transaction and lost opportunity or high future costs. CWSRFs can provide low-interest loans as interim financing while other sources of capital are secured. The CWSRFs can use a mortgage or lien on the property to secure the loan.

Front-loading would be helpful because many grants provide a consistent but small amount of support over time. For example, a grant may provide $2 million annually for land conservation. Securing a CWSRF loan to invest in an outcome and using the grants to repay the loan could yield significant cost savings.

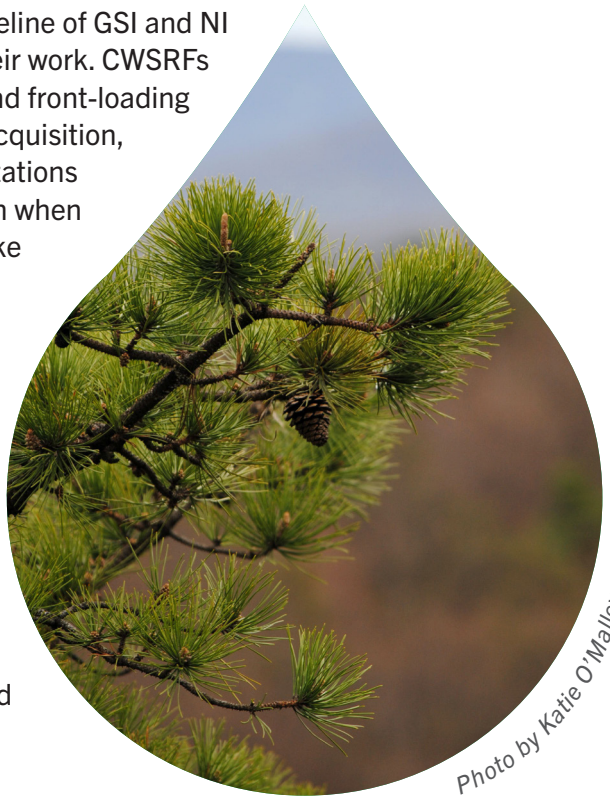


Photo by Katie O'Malley on Unsplash

21 U.S. EPA. (2018). SRF Fund Management Handbook. EPA-830-K-17-004
https://www.epa.gov/sites/default/files/2018-04/documents/fund_management_handbook_2018final.pdf

› Leverage

Competition to fund projects is greater when states receive more applications than the amount of funding available. Some states tend to only finance GSI and NI projects when demand is low. States can leverage—or use their capitalization grants as security to issue bonds—to increase the size of their capital pool. Leveraging can help CWSRF resources go further to finance more projects.

› Establish specific sub-revolving loan funds for natural infrastructure

State agencies should establish specific sub-revolving funds for natural infrastructure. With this set aside, SRF administrators can identify sought-after co-benefits–such as storm surge protection or green space–that GI and NI projects provide, solicit projects, and prioritize investment. A sub-revolving fund would also allow states to evaluate and rank applications for similar types of projects as well as create more flexible repayment terms.

Federal Recommendations

› Refine GSI and NI definitions and reporting categories

Stronger definitions and reporting categories for GSI and NI will facilitate more consistent conversations and better tracking. The NIMS category for GSI is too broad. Hydromodification should be separated from habitat restoration. Better definitions and reporting categories will make it easier to evaluate and improve the CWSRF.

› Dedicate a percentage of GPR funds to GSI and NI

The Green Project Reserve dedicates CWSRF funds to green infrastructure, water or energy efficiency improvements, and environmentally innovative activities. Currently, it does not include a minimum requirement for investing in certain project categories. The EPA estimates over half of GPR funds finance energy efficiency projects.[22] By setting a minimum requirement for the percentage of GPR funds that must finance GSI and NI, more nature-mimicking projects will be financed. This requirement could shift the CWSRF portfolio from projects that sound green but are investments in treatment facilities rather than natural features. GPR projects are more sustainable than many business-as-usual investments but many beget a form of greenwashing. It is a misnomer for projects to be considered "green" when they might not be.[23]

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› Strengthen the GPR requirement

Satisfying the GPR is a condition of a state receiving a capitalization grant. However, it may be waived if a state makes "a good faith solicitation effort in the development of its intended use plan (IUP) but is unable to identify eligible GPR projects in the amount specified by the capitalization grant".[24] If a state is unable to identify eligible projects, the EPA and states should provide technical assistance and more additional subsidies to incentivize these projects.

22 EPA. (2013). Lessons learned from implementing EPA's portion of the American Recovery and Reinvestment Act: Factors affecting implementation and program success: Green Project Reserve. Retrieved from https://www.epa.gov/sites/default/files/2015-09/documents/lessons-learned-arra-green-project-reserve.pdf

23 An explanation about why the GPR's eligible projects cannot all be considered "green" or "natural" is given in Appendix B.

24 Ames, G., & Job, C. (n.d.). Questions and Answers on the Additional Subsidy Requirement for the State Revolving Fund (SRF) Programs. Retrieved from https://www.epa.gov/sites/default/files/2015-11/documents/dwsrf13-03_questions_and_answers_on_the_additional_subsidization_and_green_project_reserves_provisions.pdf

› Support sponsorship projects

Eligible borrowers can sponsor green infrastructure projects developed by nonprofits or for-profits. The state lowers the interest rates for loans that include sponsored projects to ensure borrowers do not incur higher costs. Sponsorship provides innovative and effective third parties the financing they need to implement projects that improve water quality and public health. The EPA should report on the number and type of sponsorship projects for green infrastructure and develop materials that support their broader use.

CONCLUSION

Many states utilize their CWSRF funds to support green and natural infrastructure but overall investment lags far behind what is needed. As health challenges, climate disasters, and environmental inequalities continue to plague overburdened communities, natural and green infrastructure could spur transformational change. All levels of government, non-profit organizations, and private entities must act to better utilize the CWSRFs to invest in water infrastructure that promotes climate resiliency.

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APPENDIX A: CWSRF spending categories

This table is a list of all spending categories and their definitions considered in our analysis. The definitions are *quoted directly* from the EPA's *Clean Water SRF Program Data Definitions for Individual State and National Summary Reports.*[25]

Line #	Field Name	Definition
Centralized Wastewater Treatment		
138	Secondary Treatment	"This category includes costs necessary to meet the minimum level of treatment that must be maintained by all treatment facilities, except those facilities granted waivers of secondary treatment for marine discharges under section 301(h) of the Clean Water Act. Secondary treatment typically requires a treatment level that produces an effluent quality of 30 mg/l of both 5- day Biochemical Oxygen Demand (BOD5) and total suspended solids (secondary treatment levels required for some lagoon systems may be less stringent). In addition, the secondary treatment must remove 85 percent of BOD5 and total suspended solids from the influent wastewater. Note : Replacement or installation of individual or community septic systems or other decentralized treatment approaches are reported in Category: Individual/Decentralized Sewage Treatment."
139	Advanced Treatment	"This category includes costs necessary to attain a level of treatment that is more stringent than secondary treatment or produce a significant reduction in nonconventional or toxic pollutants present in the wastewater treated by a facility. A facility is considered to have Advanced Wastewater Treatment if its permit includes one or more of the following: Biochemical Oxygen Demand (BOD) less than 20mg/l; Nitrogen Removal; Phosphorus Removal; Ammonia Removal; Metal Removal; Synthetic Organic Removal."
140	Infiltration/inflow Correction	"This category includes costs for correction of sewer system infiltration/inflow problems. Infiltration includes controlling the penetration of water into a sanitary or combined sewer system from the ground through defective pipes or manholes. Inflow includes controlling the penetration of water into the system from drains, storm sewers, and other improper entries."
141	Sewer System Rehabilitation	"This category includes costs for the maintenance, reinforcement, or reconstruction of structurally deteriorating sanitary or combined sewers. The corrective actions must be necessary to maintain the structural integrity of the system."
142	New Collector Sewers	"This category includes costs of new pipes used to collect and carry wastewater from a sanitary or industrial wastewater source to an interceptor sewer that will convey the wastewater to a treatment facility. Note: Construction of a collector sewer to transport wastes to a cluster septic system or other decentralized facility are reported in Category: Individual/Decentralized Sewage Treatment."
143	New Interceptor	"This category includes costs for constructing new interceptor sewers and pumping stations to convey wastewater from collection sewer systems to a treatment facility or to another interceptor sewer. This category includes costs for relief sewers."

25 EPA. (2017). Clean Water SRF Program Data Definitions for Individual State and National Summary Reports. Retrieved from https://www.epa.gov/sites/default/files/2018-03/documents/cwdefinitions.pdf

144	CSO Correction	"This category includes measures used to achieve water quality objectives by preventing or controlling periodic discharges of a mixture of storm water and untreated wastewater (combined sewer overflows) that occur when the capacity of a sewer system is exceeded during a wet weather event. This category does not include costs for overflow control allocated to flood control or drainage improvement, or treatment or control of stormwater in separate storm and drainage systems."
Stormwater		
145.1	Gray Infrastructure	"This category includes costs associated with the planning, design, and construction of conveying stormwater via pipes, inlets, roadside ditches, and other similar mechanisms. This category also includes the costs of activities associated with the planning, design, and construction of treating stormwater with wet ponds, dry ponds, manufactured devices, and other similar means. Note: Projects that used to be reported under the old Urban needs category that meets this definition should be reported here."
145.2	Green Infrastructure	"This category includes costs associated with the planning, design, and construction of low impact development and green infrastructure, such as bioretention, constructed wetlands, permeable pavement, rain gardens, green roofs, cisterns, rain barrels, vegetated swales, restoration of riparian buffers and flood plains, etc. Note: Projects that used to be reported under the old Urban needs category that meets this definition should be reported here."
Energy Conservation		
146.1	Energy Efficiency	"This category includes the costs associated with the use of improved technologies and practices that result in reduced energy consumption of water quality projects. Energy efficient equipment and components can cover such things as lighting, HVAC, process equipment, and electronic systems."
146.2	Renewable Energy	"This category includes the costs associated with the production of renewable energy. Examples include wind and solar, methane capture and energy conversion equipment, biosolids drying/dewatering and energy conversion equipment, co-digestion, combined heat and power (CHP) systems, hydroelectric systems that harness wastewater flows to, from, or within a treatment works."
Water Conservation		
147.1	Water Efficiency	"This category includes the costs associated with projects that reduce the demand for POTW capacity through reduced water consumption. Examples include water meters, plumbing fixture retrofits or replacement, water efficient appliances, water efficient irrigation equipment (e.g., moisture and rain sensing equipment), and education programs."
147.2	Water Reuse	"This category includes the costs associated with the treatment and conveyance of treated wastewater that is being reused (recycled water), including associated rehabilitation/replacement needs. Examples include distribution lines and equipment for application of effluent. The costs associated with additional unit processes to increase the level of treatment to potable or less than potable but greater than that normally associated with surface discharge needs are reported as Advanced Treatment."
Nonpoint Source		
151	Agricultural Best Management Practices - Cropland	"This category covers nonpoint source pollution control activities related to agricultural activities such as plowing, pesticide spraying, irrigation, fertilizing, planting and harvesting. Some typical best management practices (BMPs) used to address agriculture (cropland) needs are conservation tillage, nutrient management, irrigation water management, and structural (e.g., terraces, waterways) BMPs."

152	Agricultural Best Management Practices - Animals	"This category covers nonpoint source pollution control activities related to agricultural activities related to animal production such as confined animal facilities and grazing. Some typical BMPs used to address agriculture (animal) needs are animal waste storage facilities, animal waste nutrient management, composing facilities, and planned grazing."
153	Silviculture	"This category covers nonpoint source pollution control activities related to forestry activities, such as removal of streamside vegetation, road construction and use, timber harvesting, and mechanical preparation for the planting of trees. Some typical BMPs used to address silviculture needs are pre harvest planning, streamside buffers, road management, revegetation of disturbed areas and structural practices, and equipment (e.g., sediment control structures, timber harvesting equipment)."
155	Ground Water	"This category covers nonpoint source pollution control activities related to ground water protection such as wellhead and recharge area protection activities. Any activity that can be attributed to a specific cause of groundwater pollution, such as leaking storage tanks, soil contamination in a brownfield, or leachate from a sanitary landfill, should be reported to that more specific category. Desalination projects that protect or restore groundwater should be reported under this category."
156	Marinas	"This category covers nonpoint source pollution control activities related to boating and marinas, such as poorly flushed waterways, boat maintenance activities, discharge of sewage from boats, and the physical alteration of shoreline, wetlands, and aquatic habitat during the construction and operation of marinas. Some typical BMPs are used to address needs at marinas are bulk heading, pump out systems, and oil containment booms."
157	Resource Extraction	"This category covers nonpoint source pollution control activities, nonpoint source pollution control activities related to mining and quarrying activities. Examples of BMPs include detention berms and seeding or revegetation."
158	Brownfields	"This category covers nonpoint source pollution control activities related to land that was developed for industrial purposes and then abandoned, which might have residual contamination. All work at brownfields should be included in this category regardless of the activity. Some typical activities used to address cleanup of brownfields sites are groundwater monitoring wells, in situ treatment of contaminated soils and groundwater, and capping to prevent stormwater infiltration."
159	Storage Tanks	"This category covers nonpoint source pollution control activities related to tanks designed to hold gasoline or other petroleum products or chemicals. The tanks may be located above or below ground level. Some typical BMPs are spill containment systems; in situ treatment of contaminated soils and groundwater; and upgrade, rehabilitation or removal of petroleum/chemical storage tanks. Note : Facilities or measures that are part of nonpoint source pollution control activities at abandoned, idle and underused industrial sites (brownfields) should be included in the Brownfields category."
160	Sanitary Landfills	"This category covers nonpoint source pollution control activities related to sanitary landfills. Some typical BMPs used to address needs at landfills are leachate collection, on-site treatment, gas collection and control, capping and closure."
161	Hydromodification/Habitat Restoration	"This category covers nonpoint source pollution control activities related to habitat protection and restoration. Examples of projects include shoreline activities (e.g., swales, filter strips), instream activities (e.g., fish ladders), and capital costs associated with the control of invasive vegetative and aquatic species. Note: Any habitat restoration projects involving stormwater management are reported in Category: Stormwater - Green Infrastructure."

162	Individual/Decentralized Sewage Treatment	"This category covers nonpoint source pollution control activities related to rehabilitating or replacing onsite wastewater treatment systems (OWTS) or clustered (community) systems. It also includes the treatment portion of other decentralized sewage disposal technologies. Costs related to developing and implementing onsite management districts are included (but not the costs of ongoing operations of such districts). Costs could also include the limited collection systems associated with the decentralized system.
163.1	Land Conservation	"This category includes the costs associated with land acquisition to protect water quality. Note : Any land purchase that is an integral part of a wastewater project (e.g., site location, land application) should be reported under the appropriate centralized wastewater treatment category"
Other Assistance		
166	Estuary (§320) Assistance	"Enter assistance provided for the development and implementation of the 28 estuary conservation and management plans established under CWA, §320. Only activities unique to §320 are included in this category (e.g. fisheries/oyster bed/shellfish restocking/restoration, fish ladders, rejuvenation of submerged aquatic vegetation). Note : All other pollution control activities related to development and implementation of estuary plans that meet the definition of one of the other categories should be reported under those respective categories."
166.1	Planning and Assessments	"This category includes costs for developing plans to address water quality and water quality-related public health problems. Examples include Watershed-Based Plans (including 319 Watershed-Based Plans) and Total Maximum Daily Load Implementation Plans."
166.2	Desalination	"Projects include treatment and disposal of brine, desalination of brackish water to augment water supply, aquifer recharge using desalinated sea water, and treatment/reinjection of brackish groundwater."

APPENDIX B: How GSI and NI differs from GPR

Congress established the Green Project Reserve (GPR) in the American Recovery and Reinvestment Act of 2009. The GRP initially required states to use 20 percent of their CWSRF funds for projects that address "green infrastructure, water or energy efficiency improvements, or other environmentally innovative activities".[26] Since its enactment, relatively little is actually known about the extent to which states allocate SRF assistance to green and natural infrastructure projects.[27]

Our goal with this report is to address this gap in analysis, as well as focus on projects that truly mimic natural processes for water quality and quantity purposes. Most of the "green" project categories in the GPR do not meet this criterion. Table B1 shows examples set out by EPA in 2012 for each of the eligible "green" project categories in the GPR. The categories of water efficiency, energy efficiency, and environmentally innovative include projects that are simply improvements to gray infrastructure. Therefore, these categories are not considered to be included in the GSI or NI categories reported in our analysis. We consider GSI and NI to include natural processes, as defined in our methods section above. Using these definitions, only the green infrastructure category from the GPR falls within our rationale.

Table B1: Examples of the GPR eligible project categories

Green Infrastructure: › Green streets › Wet weather management systems for parking areas › Implementation of comprehensive street tree or urban forestry programs › Stormwater harvesting and reuse › Downspout disconnection from sanitary sewer › Riparian buffers or floodplain restoration › Wetlands
Water Efficiency › Installing or retrofitting of water efficient devices › Water meter installation or repair › Water audits and conservation plans › Water recycling › Retrofit of landscaping or agricultural irrigation systems with more efficient systems

26 United States Congress (2009). American Recovery and Reinvestment Act, Public Law 111–5. Retrieved from http://www.gpo.gov/fdsys/pkg/PLAW-111publ5/pdf/PLAW-111publ5.pdf

27 Ramseur, J., & Humphreys, E. H. (2020). EPA Water Infrastructure Funding in the American Recovery and Reinvestment Act of 2009. Retrieved from https://crsreports.congress.gov/product/pdf/R/R46464

Energy Efficiency

- Renewable energy with a direct connection to the wastewater treatment facility (WWTF)
- Any project with at least a 20% reduction in energy consumption
- Infiltration/Inflow (I/I) detection equipment
- Energy assessments

Environmentally Innovative

- Integrated water resources management planning
- Greenhouse gas (GHG) inventory or mitigation plan
- Construction of LEED-certified building for the WWTF
- Decentralized wastewater solutions