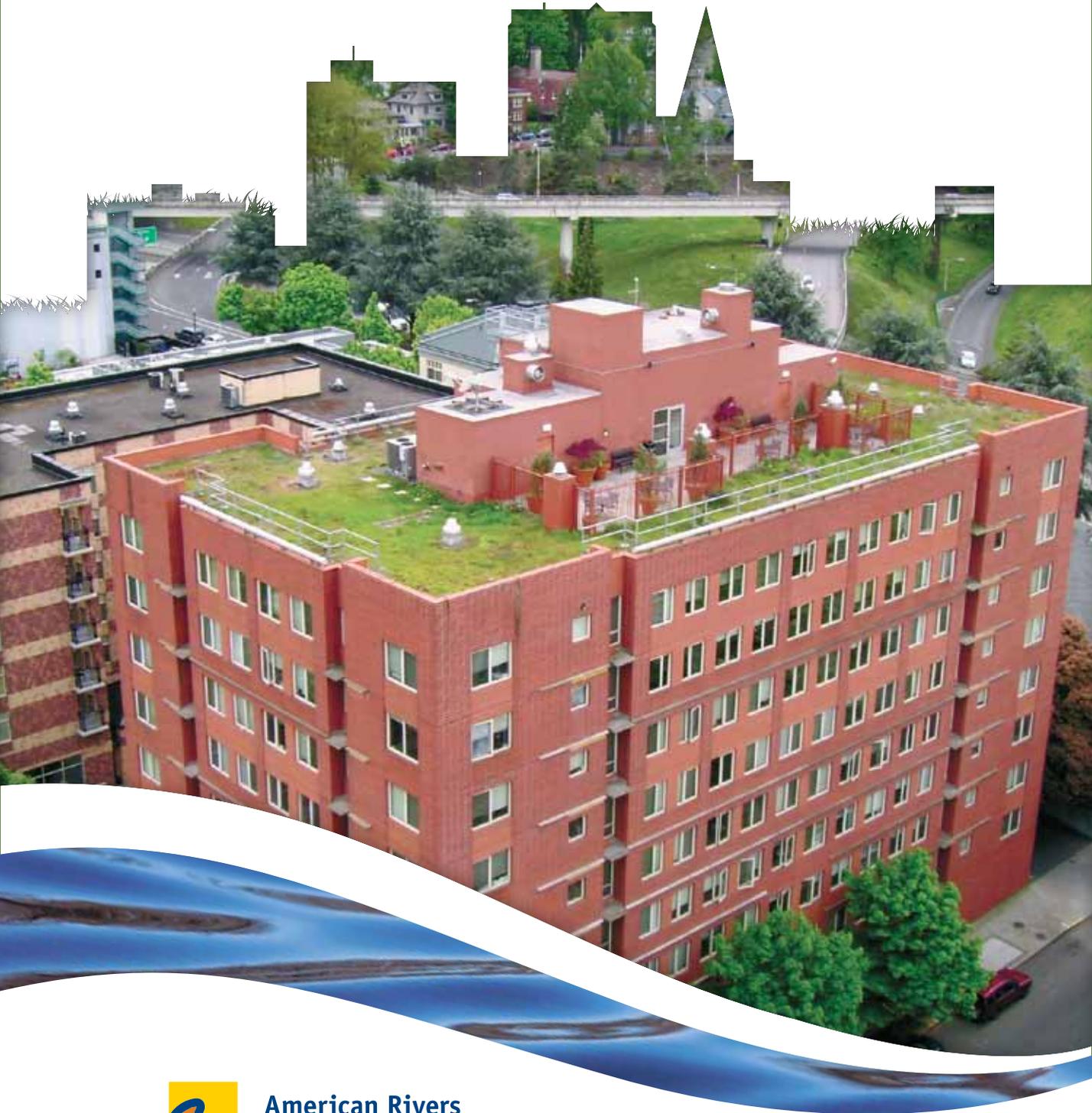


# Putting **Green** to Work

Economic Recovery Investments for Clean and Reliable Water



**American Rivers**  
*Thriving By Nature*

*We must move from old 19th century infrastructure to a wiser combination of green and traditional infrastructure that will meet the needs of the 21st century.*

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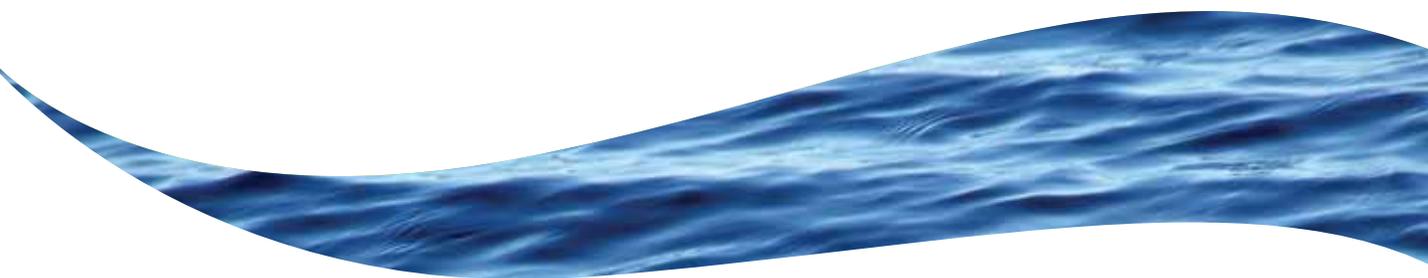
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For more information:

**[www.americanrivers.org/greenfunding](http://www.americanrivers.org/greenfunding)**

# Putting **Green** to Work

Economic Recovery Investments for Clean and Reliable Water



## Executive Summary

Only a few days after taking office, President Obama signed the American Recovery and Reinvestment Act of 2009 (ARRA), the largest government public works package since the New Deal. ARRA included a much-needed \$6 billion for clean water and drinking water infrastructure.

Like much of the nation's infrastructure, our water systems are crumbling. After several decades of inadequate investment and unmanaged sprawl, America's water and wastewater systems now receive the lowest grade, a D-, of all infrastructure rated by the American Society of Civil Engineers. EPA already estimates capital investment needs for clean water and drinking water infrastructure at more than \$600 billion over 20 years<sup>1</sup>. Forecasts for greater extremes due to climate change will make the

problem worse, as more frequent and intense storms will increase flooding and produce corresponding sewer overflows and stormwater pollution. And more frequent and intense droughts will cause water shortages and higher concentrations of water pollution.

At the same time, we are in dire need of a new approach to investing in America's clean water and drinking water infrastructure. We are at a crossroads today in how we manage our water systems. Traditional water infrastructure will continue to play a role, but much of it is static, solves only a single problem, and requires a huge expense to build and maintain. We must move from old 19th century infrastructure to a wiser combination of green and traditional infrastructure that will meet the needs of the 21st century.

## *We are in dire need of a new approach to investing in America's clean water and drinking water infrastructure.*

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The American Recovery and Reinvestment Act (ARRA) took a groundbreaking step in the right direction, dedicating twenty percent (\$1.2 billion) of water infrastructure funding to programs for green infrastructure, water and energy efficiency and environmental innovation (collectively called the Green Project Reserve). This effort represented the first, decisive step in a much needed shift away from solely “gray,” inflexible water infrastructure towards innovative approaches that will bring our water management into the 21st century.

More communities are beginning to understand that economic vitality and resilience to climate change rest on adaptation strategies that provide multiple benefits for every public dollar invested. By dedicating 20 percent of water infrastructure funding for the Green Project Reserve, ARRA provided states with the resources to repair and rebuild their water and sewer systems to protect communities for a future marked by more frequent and more intense droughts and floods.

Just as we continue to reap the benefits of the New Deal more than sixty years later, the Green Project Reserve will result in lasting changes toward environmental sustainability for years to come. This report examines the implementation of this Green Project Reserve.

### **AMONG THE KEY FINDINGS:**

- The need for funding for “green” projects is far greater than the 20 percent provided through this effort. States have substantial lists of “shovel-ready” green projects that simply lack funding;
- Within the overall category of “green,” we identified a group of “bright green” projects that provide a comprehensive set of environmental and economic benefits. Future investments should be targeted toward these bright green projects;



- Some states, such as Maryland and New York, are clearly leaders and should be used as models for other state programs.

The report also builds on nearly a decade of work by American Rivers to reform the nation's primary public water infrastructure fund, the federal State Revolving Fund (SRF) program, and includes a series of recommendations on how to sustain the progress begun under ARRA.

## AMONG THE KEY RECOMMENDATIONS:

### NATIONAL

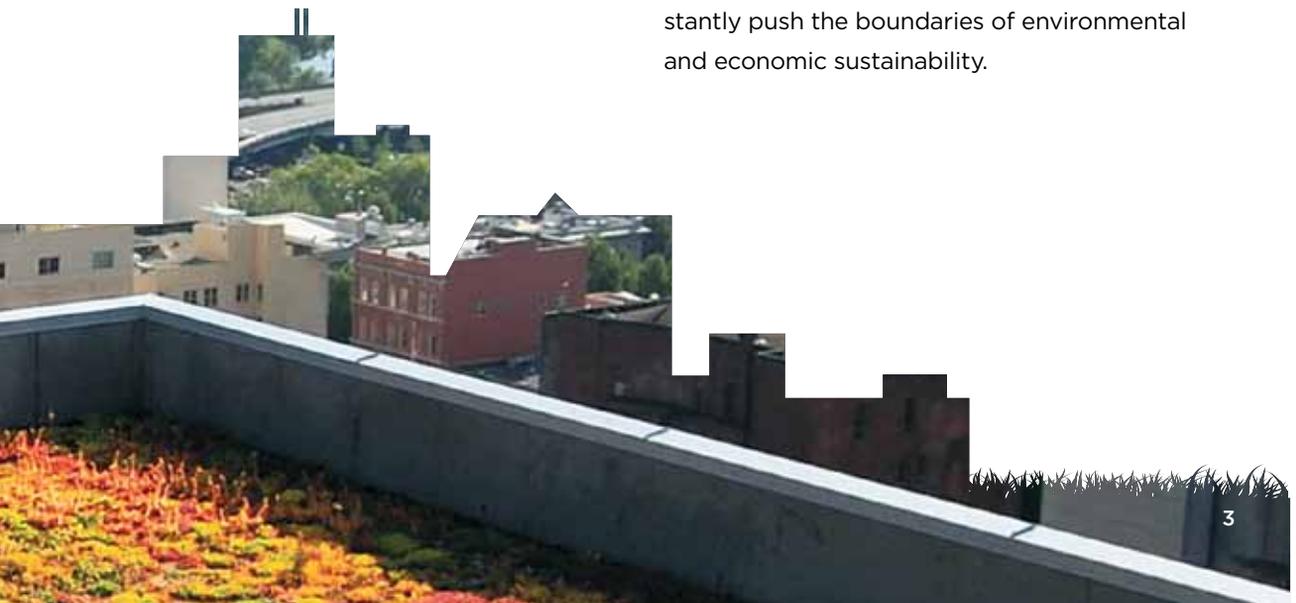
- Federal water infrastructure funding should be continued and increased to support state demand for bright green projects. Congress should reauthorize the Clean Water and Drinking Water State Revolving Funds to include dedicated funding for bright green projects;
- Federal water infrastructure funding should provide incentives for states to fund bright green projects such as waiving state match requirements;
- EPA must continue to improve its funding guidance to states and provide additional technical assistance to ensure the best use of limited funds;

- Funding for water infrastructure and climate adaptation should be aligned to promote bright green approaches to create resilient communities.

### STATES

- States must act quickly to remove statutes, regulations or policies that stand in the way of pursuing integrated approaches to bright green infrastructure;
- Project evaluation criteria should be revised to reflect and prioritize multiple environmental benefits;
- Vigorous outreach for new Green Reserve Projects to a range of traditional and non-traditional partners should be required in order to result in a wide range of strong projects;
- States should promote loan-payback mechanisms for green projects to ensure that communities can integrate these approaches as part of regular financial planning for clean and safe water.

ARRA marked a bold step forward for our nation, but it was only a first step. Now we must continue to accelerate our progress toward 21st century bright green infrastructure to ensure long-term reliable clean water supplies. The challenge is to make today's bright green tomorrow's norm, and to constantly push the boundaries of environmental and economic sustainability.





## Introduction

Only a few days after taking office, President Obama signed the American Recovery and Reinvestment Act of 2009 (ARRA), the largest government public works package since the New Deal. ARRA included a much-needed \$6 billion for clean water and drinking water infrastructure through the State Revolving Fund, the biggest federal infusion of water infrastructure money through the fund ever. As part of this package, 20 percent (\$1.2 billion) of this water infrastructure funding



was dedicated to programs for green infrastructure, water and energy efficiency, and environmental innovation (called the Green Project Reserve). This effort was groundbreaking because it represents the first step in a much needed shift away from solely “gray,” inflexible water infrastructure towards innovative approaches that will bring our water management into the 21st century. These innovative solutions work with nature, instead of against it, to meet the needs of people and rivers in a future marked by more extreme and frequent floods and droughts. This sea change in the way we direct infrastructure dollars was achieved due to a strong coalition of industry, utility and environmental supporters working with select states and communities to make a compelling case that green infrastructure and water efficiency are wise investments to create jobs, protect clean water and deliver a wide variety of other benefits.

**The publicly accessible Amy Joslin Memorial Eco-Roof on the Multnomah Building in Portland, Oregon is a 12,000 square foot green roof designed to control runoff, reduce pollutant loads, and add green space to the local community.** Credit for both photos above: Portland Bureau of Environmental Services / Emily Hauth

In this report, American Rivers analyzed Green Project Reserve spending in 19 states for demand, project type and projected environmental benefit. We also looked at summary national data as reported by states to EPA, and compared this to our in-depth analysis of these 19 states.

Across the country, EPA and the states did a tremendous job at distributing and prioritizing these funds under the significant time pressure required by ARRA. We found first that demand for this type of funding is high and far exceeds the amount of funding currently available. Second, some of the specific projects funded and some of the state funding programs catalyzed by the Green Project Reserve reflect a more sustainable approach to water



**The green roof on the EcoCenter at Heron's Head Park is an integral part of San Francisco's first "off-the-grid" building that won't use city sewer or electricity services or burden existing infrastructure. Instead, this environmental education center uses native landscaping, wetlands, rainwater capture and alternative energy sources to reduce water use and provide clean energy and water.**

Photo credit: Literacy for Environmental Justice / Laurie Schoeman

## Climate Change Impacts to Freshwater Resources and Water Infrastructure

Water resources in the U.S. face a range of threats in a warming climate. Many communities will see their water supplies shrink as temperatures rise and precipitation patterns shift. A rise in severe storms will degrade water quality and increase the risk of catastrophic floods. Changes in the timing and location of precipitation combined with rising levels of water pollution will strain ecosystems and threaten the survival of many fish and wildlife species. These shifts will have dramatic impacts on communities, threatening public health, weakening economies and decreasing the quality of life in many places.

**Water Quantity.** Rising temperatures will have a profound effect on water availability. Communities already struggling to meet rising demands may be unable to meet the needs of agriculture, industry, ecosystems and rising populations. Every part of the country will struggle as weather patterns become more unpredictable and render historical climate records obsolete. Climate change threatens to fundamentally alter where and when water is available across the nation. Precipitation

patterns are shifting, benefiting some regions with additional water while reducing snow and rainfall in other areas.

**Water Quality.** The same climate shifts that will challenge water availability will also pose a number of threats to the quality of the nation's water resources. Warming temperatures and changing precipitation patterns could make some water bodies unsuitable for recreation, water supply and other purposes. At a minimum, water management will be more difficult and more costly due to rising pollution levels.

Much of the debate related to climate change focuses on reducing greenhouse gases — rightfully so considering that unabated emissions would have catastrophic consequences for the planet. Yet, many communities and policy makers have largely ignored the changes that will need to be made to our water infrastructure systems to provide the flexible solutions that can adapt well to the volatile conditions we are already seeing from a changing climate.

*“Green infrastructure allows a city to evolve into a sustainable place over time; softening its future path for sound water management while providing multiple benefits to its above-ground infrastructure with every new building developed, tree planted and wetland re-born.”*

HOWARD M. NEUKRUG, DIRECTOR, OFFICE OF WATERSHEDS, PHILADELPHIA WATER DEPARTMENT

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infrastructure, signaling a transformation. Third and finally, there is both the need to continue to improve the types of projects funded to better maximize environmental benefits in a move towards bright green, and the need to reduce the portion of limited water infrastructure dollars used for standard energy efficiency upgrades.

These findings are significant given that the Green Project Reserve has been extended, with another \$700 million in FY10 dedicated to these more sustainable approaches. This

creates additional opportunities to effectively transform our water infrastructure under a regular funding cycle for state SRF programs, without the time pressures associated with the economic stimulus. The initial \$1.2 billion investment for greener and more efficient water infrastructure across the nation has set the stage for a broader federal commitment to these approaches, while providing the impetus for states and communities to commit to addressing their water needs in a more cost-effective, sustainable manner.

### **Water Infrastructure Funding: State Revolving Funds**

The nation’s water infrastructure is outdated and repeatedly receives a D- grade from the American Society of Civil Engineers — the lowest rating of any infrastructure category<sup>2</sup>. Meanwhile, despite growing need, federal funding for water infrastructure has declined sharply. The American Recovery and Reinvestment Act (ARRA) of 2009 provided \$6 billion for investment in water infrastructure via the Clean Water and Drinking Water State Revolving Funds (SRF). These funds represent a downpayment on water infrastructure investment needs, estimated for clean water alone at almost \$300 billion over 20 years<sup>3</sup>. The SRF is administered by the Environmental Protection Agency (EPA) through the states,

and provides low-interest loans to communities for a variety of water infrastructure projects<sup>4</sup>. For the first time, twenty percent of this money was reserved for green infrastructure, water or energy efficiency and environmentally innovative projects, collectively referred to as the “Green Project Reserve.” While these innovative methods have long been eligible for federal SRF funding, few states have used any of their SRF funds for such projects. In an era of limited resources, directing federal water infrastructure dollars to achieve and leverage the greatest and widest range of environmental benefits, as highlighted by the best, bright green use of the Green Project Reserve, must be a priority.

## Green, Efficient, and Innovative Water Infrastructure Explained

Faced with crumbling urban infrastructure, decades of poorly planned development and forecasts for more extreme floods and droughts due to climate change, we are in dire need of a new approach to investing in America's water treatment and drinking water infrastructure. More frequent and intense storms will increase flooding and produce corresponding sewer overflows and stormwater pollution. More frequent and intense droughts will cause water shortages and higher concentrations of water pollution. Green infrastructure approaches to clean water management include using rooftop vegetation to control stormwater and reduce energy use, restoring wetlands to retain floodwater, installing permeable pavement to mimic natural hydrology, and using water more efficiently. Water efficiency improvements help communities accomplish more with less, using the best available technology to utilize water in smarter and more innovative ways.

Such smart infrastructure approaches have far-reaching benefits — they reduce stormwater runoff and sewage overflows, recharge drinking water supplies, and create valuable natural spaces for community enjoyment. They also cost less than traditional pipes, treatment plants and reservoirs, and create domestic jobs. By treating water on-site and reducing water use, green stormwater controls and water efficiency reduce energy costs and corresponding greenhouse gas emissions by decreasing the amount of water that must be pumped, distributed and treated. Moreover, these green approaches are flexible in terms of scale and can be integrated at the building and neighborhood scale as well as across watersheds and river basins. The



**Rain barrels are installed to help reduce flooding and stormwater pollution as part of a neighborhood revitalization plan in Landsdowne, Pennsylvania. Rain barrels collect water that can be used for outdoor water use, reducing the need for highly treated municipal water.**  
Photo credit: American Rivers / Sara Strassman

multiple benefits of these approaches and the reliability and flexibility that they provide make them a perfect response to the uncertainties and volatility of a changing climate. Finally, these approaches create jobs across diverse sectors such as plumbing, landscaping, and engineering. Covering even one percent of large buildings in America's medium- to large-sized cities with vegetated roofs could create over 190,000 jobs and provide billions in revenue to suppliers and manufacturers that produce or distribute green-roof related materials. A \$10 billion investment in water efficiency projects would produce a total economic output of \$25-28 billion and create 150,000 to 220,000 jobs<sup>5</sup>.

In this report, the approaches described here are collectively referred to as bright green strategies to distinguish them from other eligible green projects with fewer environmental benefits (see in the pages that follow).

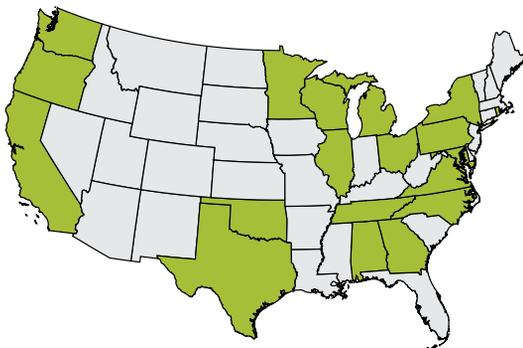
# Methodology

This study focused on a subset of 19 states (AL, CA, GA, IL, MD, MI, MN, NC, NY, OH, OK, OR, PA, RI, TN, TX, VA, WA, and WI) targeting some of the most populated regions of the country (see Figure 1). These states are primarily places where American Rivers staff or our conservation partners are actively engaged in on-the-ground work.

A copy of each state’s data compiled by American Rivers was sent to appropriate clean water and drinking water state officials for their review. American Rivers analyzed the data for demand, project type and projected environmental benefit. Funded projects were those projects on the state’s final list submitted to

EPA. The unfunded projects were those projects that were submitted and eligible for funding, but for some reason or combination of reasons (e.g. not shovel-ready), were not selected for funding. As part of the ARRA process, EPA created guidance for the states on the types of projects that were eligible for Green Project Reserve funding for each Congressionally designated category (green infrastructure, water efficiency, energy efficiency, and environmental innovation). For projects where eligibility was unclear, EPA required development of a “business case” to show substantial green project reserve benefits<sup>6</sup>. Projects could be either stand-alone projects or integrated into existing water infrastructure systems.

**FIGURE 1: 19 Study States**



**American Rivers compiled Green Project Reserve information from each state’s Clean Water and Drinking Water SRF Intended Use Plans, U.S. EPA reports, and personal communication with state and federal agency staff. Based on this information, American Rivers compiled a database of 1,468 funded and unfunded green projects in the 19 states. To our knowledge, this is the only comprehensive database of this kind. Projects deemed ineligible for Green Project Reserve funds and those voluntarily withdrawn by the applicant were not included in American Rivers’ green project database.**

## Bright Green Projects

Traditional water management often relies solely on engineered infrastructure like pipes, pumps, dams, and treatment plants, that only attempt to solve a single problem. It requires a huge expense to build and maintain, consumes large amounts of energy, damages the environment, and is not well-suited to meet the needs of an unpredictable and changing climate.

21st century green infrastructure solutions preserve and restore natural landscapes, prevent wasteful water use, and work with nature rather

than against it. While traditional water infrastructure will continue to have a role, communities that invest in a broad suite of green infrastructure approaches like the ones described above will lessen the impacts of an increasingly volatile climate by improving the health of valuable ecosystems, providing flexibility to handle a wide range of conditions and uncertainty, and providing other community benefits at the same time.

As part of this analysis, American Rivers further refined EPA’s broad categories of eligible projects. We defined a subset of project types

that, in our view and experience, best replicate, enhance or leverage nature’s sustainable strategies for water management, achieve the greatest degree of water savings, and create the widest range of environmental benefits. We called these “bright green” projects to distinguish them from more traditional water infrastructure projects (see Table 1). We believe that these bright green projects show the greatest promise and potential for the future of clean water and drinking water infrastructure. Throughout this report we provide examples of these projects and strategies as well as recommendations for how EPA and states can do more to promote and fund

this kind of transformative, sustainable infrastructure. In the context of ARRA funding, we did not consider basic energy efficiency investments to be bright green for these key reasons: energy efficiency does not provide direct water quality benefits and other bright green practices also reduce energy use (see Table 1 below). Additionally, there are many other funding sources (including ARRA funds) for energy investments and many of these investments pay back quickly in reduced costs to the utility, making them less important for scarce federal water infrastructure dollars.

**TABLE 1: Bright Green\* Project Types that Best Leverage Sustainable Strategies to Achieve Clean Water and Reduce Water Use as a Subset of All Eligible Green Project Reserve Project Types compared to “Green”\*\* Project Types**

Project Types	Improves water quality	Traps/slows runoff	Reduces water demand & increases reliable water supply	Recharges groundwater	Improves habitat	Reduces flooding	Reduces energy use	Other
<b>Bright Green</b>								
<b>Green</b>								
Green roof	✓	✓				✓	✓	(1,3)
Pervious surface	✓	✓		✓		✓		
Stormwater bioretention (e.g. swales, green streets, raingardens, green walls)	✓	✓	(2)	✓	✓	✓	✓	(3)
Riparian habitat restoration	✓	✓		✓	✓	✓		( 3 )
Stormwater capture, reuse	✓	✓	✓			✓	✓	
Stream restoration, erosion control	✓	✓			✓	✓		
Wetland restoration	✓	✓		✓	✓	✓		
Install water meters (first-time)			✓		(4)		✓	
Leak detection/control			✓		(4)		✓	
Install low flow fixtures			✓		(4)		✓	
Drinking water treatment plant upgrade			✓					
Water supply distribution pipes, pumps, wells			✓					
Energy efficient equipment							✓	
SCADA (computer-controlled processes)	✓						✓	
Sewer pipe upgrade	✓							(5)
Stormwater retention	✓	✓				✓		
Replace water meters								(6)
Water recycling	✓					✓		

\* Projects that protect, restore or replicate natural function or that create real reductions in water use, in addition to other benefits.

\*\* Other types of projects eligible under EPA Green Project Reserve Guidance providing fewer multiple, sustainable environmental benefits

(1) Reduces urban heat island, extends roof life

(2) Can reduce demand for outdoor water use

(3) Aesthetic, quality of life increases

(4) When water savings returned to river

(5) Reduces likelihood of SSOs

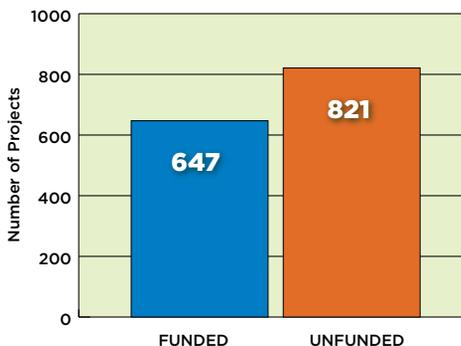
(6) Ensures accurate billing

# Green Project Reserve: Findings and Analysis

Our findings and analysis show that demand for the Green Project Reserve well outstripped availability of funds, and that many states used over the required 20 percent for these projects. Within this funding, it is critical to shift to more spending on bright green projects and we analyze some initial models for how to do so.

## ***Demand for Green Project Funding Exceeded Availability.***

- Despite skepticism and concern that there was insufficient demand, all 50 states were able to use nearly 50 percent more than required of water infrastructure funds for green infrastructure, water and energy efficiency, and environmentally innovative projects as required under ARRA. Although ARRA only required states to utilize 20 percent of funds for green projects, nationally, 30 percent of clean water and 29 percent of drinking water funds were used for the Green Project Reserve<sup>7</sup>. Similarly, the 19 states we analyzed spent an average of 28 percent of their clean water and drinking water funds combined for green projects. Six states nationally used almost half or more of their clean water infrastructure money on green projects<sup>8</sup>.
- Cities, utilities and partner groups aggressively pursued green funding, and as a result demand far exceeded supply for Green Project Reserve funding. The number of Green Project Reserve projects left unfunded (821) exceeded the number of funded Green Project Reserve projects (647) by at least 27 percent in the 19 study states (see Figure 2). This is all the more remarkable given that states and communities were under extreme time pressure to fund projects they had rarely, if ever, considered before (loan applicants' projects were required to be



**FIGURE 2:** Number of green projects funded vs requested but unfunded in 19 study states

under contract within one year from the time the ARRA bill was signed).

Even the 821 unfunded projects we compiled in the 19 study states are likely a significant underestimate of the demand for green reserve funding for two reasons. First, some study states did not have these data on unfunded green projects readily available to share publicly, and thus the unfunded projects are not represented. Second, states achieved what they did under immense time pressures — under a regular SRF funding cycle, states will have more time to fully solicit and review potential green projects. Therefore, the 821 unfunded green projects are, without question, a significant underestimate of the true demand for continued Green Project Reserve funding.

## ***From Green to Bright Green: Green Project Reserve funding must be better deployed to maximize environmental and community benefits.***

A number of states funded exemplary, bright green projects that represent a real shift in approaches to clean and reliable water, some of which are highlighted throughout this report. Even so, only about one quarter of all

funded green projects in the 19 study states included at least one project component that American Rivers ranked as bright green for best leveraging sustainable strategies for water management (see Appendix Table A). Clean water SRF projects included more bright green components (36 percent) than did drinking water SRF projects (10 percent) (see Table 2).

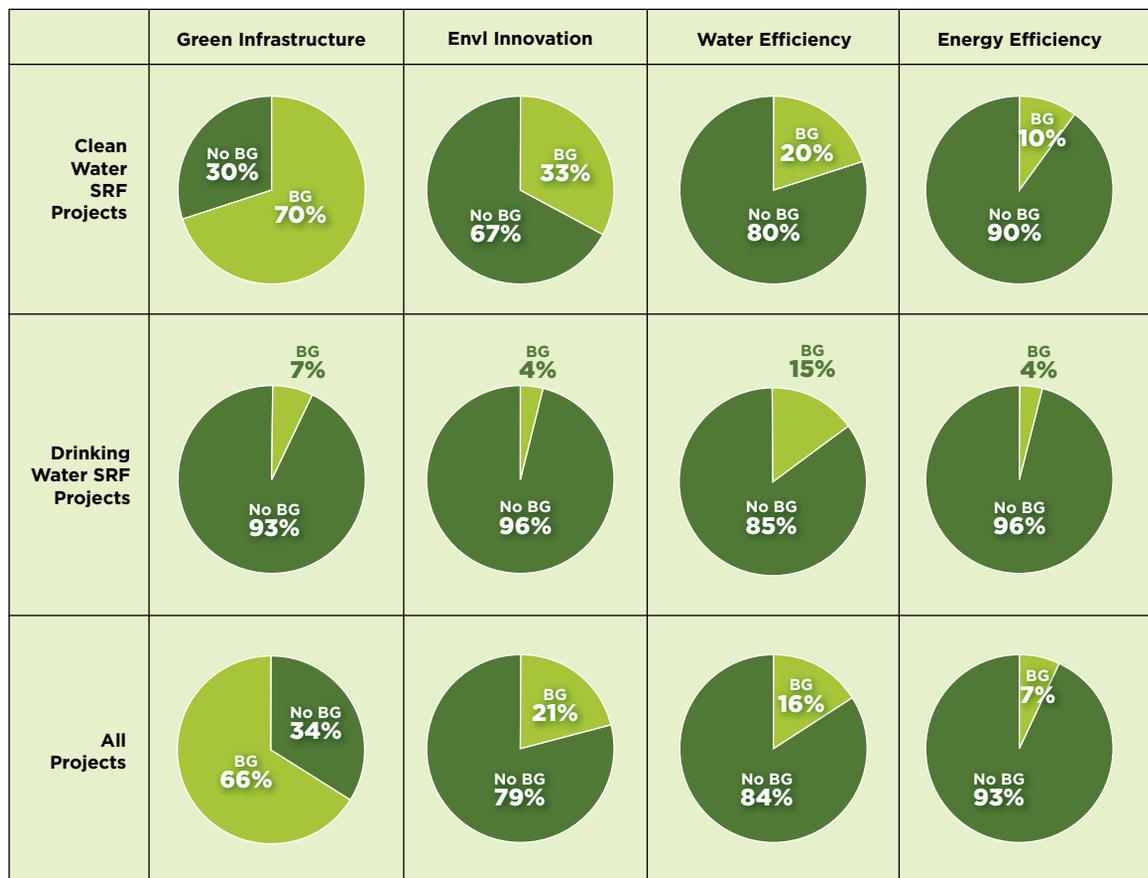
The green infrastructure category projects utilized the greatest number of bright green

components, followed by environmental innovation, water efficiency projects and finally energy efficiency (see Figure 3). Stormwater using natural filtration (bioinfiltration), pervious pavements, and wetland restoration and creation account for the highest number of funded projects with bright green components (see Appendix Table A). Energy efficiency projects received the most funding and yet had the fewest bright green components for transforming water infrastructure.

**TABLE 2: Number of funded Green Project Reserve projects with at least one bright green component in 19 study states**

	Clean Water SRF	Drinking Water SRF	Combined
Number of projects with at least one bright green, sustainable component	142	26	168
Total number of funded projects	393	254	647
Percentage of projects with at least one bright green, sustainable component	36%	10%	26%

**FIGURE 3: Percent of projects in 19 study states with at least one bright green component**



Green projects with at least one Bright Green component.
  Green projects with NO Bright Green components.

*“There is a transition taking place here. With this [green street] project, the civil engineers now can design a bioretention bed, these laborers now can set porous pavement, these electricians can install LED lighting. These planners and tradesmen and women are the bedrock of our emerging green economy – we’re a small town – if we can do it anyone can.”*

MAYOR ADAM ORTIZ, EDMONSTON, MARYLAND

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**Water efficiency projects were funded for the first time in many states with State Revolving Funds, but future funding should be directed to projects that achieve real water savings.**

For the 19 study states, water efficiency projects accounted for nearly half of all drinking water projects funded through the Green Project Reserve. Demand remains high as 45 percent of unfunded Green Project Reserve drinking water and clean water projects fall under EPA’s water efficiency category. However, many of the water efficiency projects funded, while eligible under EPA’s guidance, do not result in significant new water savings because they simply replace existing meters. The low percentage of bright green projects in the drinking water category reflects this fact

(see Figure 3). Future funding should prioritize water efficiency projects that achieve the greatest, real water savings, such as residential retrofits with low-flow fixtures, sub-metering apartment buildings, leak detection, and other water saving strategies (see box, “Re-Metering: Good Business Practice But Not Necessarily Bright Green”).

**Spotlight Projects:** In Douglasville, Georgia a \$300,000 rebate program for homeowners was developed using clean water Green Project Reserve funding to replace older toilets with newer, efficient models. An estimated 1,500 homeowners are expected to benefit from this program and each can earn up to \$200<sup>9</sup>. As Pete Frost, the Executive Director of the Douglasville-Douglas County Water Sewer Authority said, “Not only does the program save our customers money, but it saves us money in the long run because we won’t have to expand facilities. There are also the added environmental benefits from eliminating the need to build and expand reservoirs and saving the energy no longer needed to pipe, treat and pump the water.”

**Re-Metering: Good Business Practice, but Not Necessarily Bright Green**

Metering is defined as the installation of a device that measures the actual amount of water used by a customer, building or process. Installation of new and replacement water meters were very popular projects under the Green Project Reserve. Georgia alone funded five metering projects and they were the only type of project funded under Georgia’s drinking water portion of the Green Project Reserve.

While first-time water metering projects have been proven to secure upwards of 15 percent water savings, re-metering has not been proven to secure additional savings<sup>10</sup>. Re-metering is a good business practice for water utilities as it captures “paper” water losses, water that is not billed although it is still consumed. However, given the lack of real water savings from re-metering, any Green Project Reserve funded metering projects should focus on first-time metering projects only.

**Energy efficiency projects comprised the largest category of funded Green Project Reserve projects, and dollars spent, without clear direct benefits to clean and safe water.**

**TABLE 3: Funded dollars distribution and percentage among Green Project Reserve categories for 19 study states\***

Project	Green Infrastructure	Water Efficiency	Energy Efficiency	Environmental Innovation
Clean Water Projects	\$179,194,094	\$67,387,356	\$295,948,968	\$114,779,206
Drinking Water Projects	\$6,200	\$216,673,298	\$66,759,344	\$28,808,232
<b>Total/percentage</b>	<b>\$179,200,294/18%</b>	<b>\$284,060,654/29%</b>	<b>\$362,708,312/38%</b>	<b>\$143,587,438/15%</b>

\*Dollars per category per project were taken directly from EPA's 3/25/2010 file sent to American Rivers.

The largest portion of Green Project Reserve funded projects in the 19 study states were energy efficiency projects by both dollars spent and by number of funded projects (see Table 3), and in some states, almost all water infrastructure money was used for energy efficiency (see Appendix Figure A). This is consistent with EPA data on national spending where energy efficiency was also the lead category. The large amount of funding for energy efficiency under ARRA may be due to the relative engineering ease of making such improvements under time pressure<sup>11</sup>. While energy efficiency is a critical environmental goal and there is a strong water-energy nexus, in many cases, it is not clear what direct water quality benefits, if any, were realized through these projects. American Rivers has consistently urged that limited federal clean water funds not be used for basic energy efficiency purposes, both because many of these investments easily provide an adequate return on investment in a short time period and should be part of a utility's regular operating practices, and because other funding sources exist for this purpose. Further, other bright green practices such as water efficiency and stormwater reuse also reduce energy demand.



Thus, although the Green Project Reserve represents a shift in the direction of federal funding to more sustainable water infrastructure, we must better deploy these resources to fund more bright green water infrastructure projects that are more flexible and cost-effective, and provide a much broader array of community and environmental benefits. The demand for projects with bright green components is strong: in the 19 study states, there were as many documented projects with bright green components (168) waiting for funding as there were funded projects with at least one bright green component (see Appendix Table B). Current demand for future funding for bright green projects is led by wetland restoration and construction projects, stormwater bioinfiltration, and installation of first-time meters (see Appendix Table A).



## From Green to Bright Green: Effective State Models

### **Effective Outreach**

State programs that American Rivers considered exemplary had strong outreach efforts, which in turn generated a robust list of potential green and bright green projects, allowing those states to invest their limited dollars in the very best projects. Some common characteristics of these state programs included active outreach to traditional and non-traditional SRF recipients, state policy that allowed funding of the full range of federally eligible projects and innovation, and a commitment to using funding incentives for bright green projects.

Of the 19 states, Maryland stands out as exemplary, with the highest percentage (64 percent) of green projects with at least one bright green component. Other strong states include New York and Rhode Island, where over 40 percent of green reserve-funded projects contained at

**Photo above: Permeable pavement allows rain to filter through to soil below instead of washing off paved surfaces and polluting nearby waterways. This parking lot at Chicago's Maxwell Market used permeable pavers and an adjacent vegetated area to reduce stormwater runoff, flooding, and the urban heat island effect while still maintaining the functionality of the area as an outdoor market.** Photo credit: American Rivers / Kathryn Swartz

**Spotlight State — Maryland:** In Maryland, the state chose to provide additional subsidization to projects that received funding under the Green Project Reserve that ranged from wetland restoration, to creating “living shorelines,” to improving water efficiency through water appliance retrofit programs. For example, the town of Edmonston received over \$1 million to construct a ‘green street’ that will create or preserve 50 jobs<sup>12</sup>. Thirty maple, elm, sycamore and oak trees will line the street, and energy-efficient streetlights will be powered by wind. Permeable concrete and moisture-loving plants will absorb and filter 90 percent of the polluted stormwater that typically flows into the Anacostia River to reduce flooding and pollution. In Anne Arundel County, several towns received funding to protect and construct new wetlands as living shorelines to safeguard existing habitat and prevent erosion, consistent with the state’s climate adaptation priorities. The City of Baltimore received more than \$2 million to retrofit wasteful and outdated plumbing fixtures with new water efficient devices that will save the City water, energy and money.

least one bright green component. For example, the Narragansett Bay Commission in Rhode Island is constructing a new LEED silver certified operations building that will include a green roof, pervious pavement, vegetated swales, and drought tolerant landscaping.

Active outreach to non-traditional funding applicants was essential to broaden the type and scale of projects funded. New York, for example, promoted the Green Project Re-

serve broadly through their Green Innovation Grants program, and hosted webinars and local presentations. Pennsylvania had a separate solicitation for green projects and hosted informational meetings. California funded a broad range of projects and non-traditional recipients, including the Los Angeles and San Gabriel Rivers Watershed Council, Santa Monica Baykeeper and the Truckee Watershed Council, who are all implementing bright green projects<sup>15</sup>.

#### **State Spotlight — New York’s Green Innovation Grant Program:**

New York took a unique approach to the Green Project Reserve by using a significant portion of this funding to create a new program — the Green Innovation Grant Program<sup>15</sup>. Under this program, New York was able to separately solicit and evaluate green projects, ultimately funding 57 projects for just under \$45 million, with the balance of state Green Project Reserve funds used to integrate existing gray and green infrastructure. Projects included the Green City Homes project in Syracuse, a solution to housing needs and a demonstration of green homes that save water and energy and manage stormwater with green infrastructure solutions. Green City Homes will utilize pervious roadways and sidewalks to manage over one million gallons of stormwater that would otherwise contribute to combined sewer overflows. The Lindenhurst Memorial Library in Suffolk County used grant funds to install a new green parking lot using permeable pavers and vegetation to reduce stormwater impacts from the municipal library. Designed to infiltrate more than 150,000 gallons of stormwater from the site, the project’s benefits are already being reported in the local paper: “The rain sloshing down on Long Island Tuesday flooded roads and turned driveways into lakes. But no water pooled in the new lot at Lindenhurst Memorial Library — even during the worst of the storm<sup>14</sup>.”

#### ***Integrating green and gray solutions and moving toward more bright green projects***

While “active solicitation” for Green Project Reserve projects was required of all states, time pressure led some states to choose to

**Spotlight Projects:** The City of Spokane, Washington received funding to install “storm gardens” that use low impact development techniques to reduce the amount of stormwater runoff. As part of the West Broadway Spokane Urban Runoff Greenway Experiment (SURGE) project, 37 planters will be installed between the curb and sidewalk to detain stormwater and allow it to infiltrate into the ground, reducing the amount of polluted stormwater runoff discharged into the Spokane River. In Seattle, the Ballard Green Streets project received \$1.54 million to install 10 blocks of swales in order to control stormwater runoff from 2.6 acres of impervious surface<sup>16</sup>. This will reduce the amount of stormwater runoff that flows into the City’s combined sewer overflow system and decrease pollution in the Lake Washington Ship Canal which is a key migration corridor for salmon<sup>17</sup>. The Yauger Park project in Olympia, Washington will increase stormwater storage and reduce erosion by constructing wetlands, a 5,000 square foot rain garden, bio-swales, and a new parking lot using pervious pavement.

focus on adding green elements to existing, centralized water infrastructure projects instead of seeking out innovative projects that provide multiple community benefits and more cost-effective environmental solutions than traditional infrastructure. American Rivers favors both integrating bright green elements into existing water infrastructure as well as expanding the concept of water infrastructure to ensure funding for a range of more non-traditional, decentralized projects (such as rain gardens and green streets) that collectively achieve clean and reliable water supplies<sup>18</sup>. We believe that a larger share of federal infrastructure investments should be directed in the future toward bright green strategies that help communities and utilities transition toward less costly and more resilient water management.

### **Removing Administrative Barriers**

Removing state-based barriers to funding green infrastructure, water efficiency and other environmentally innovative activities is another important key to funding more bright green projects under the Green Project Reserve. Some states have legislative, regulatory or policy barriers to funding a full range

### **State Spotlight — Green Project Reserve Spurs First Green Loan in Pennsylvania:**

Pennsylvania used Green Project Reserve funds for innovative grant projects throughout the Commonwealth including \$1.2 million in Pittsburgh to the non-profit organization, Friends of the Pittsburgh Urban Forests, to plant trees and install permeable pavers to reduce polluted stormwater runoff from parking lots into the City's combined sewer system. Importantly, the shift to funding green projects catalyzed the state funding agency (PENNVEST) to make the state's first low-interest green loan for \$30 million to Philadelphia as part of that city's ambitious plan to maximize the use of green infrastructure to reduce stormwater and combined sewer overflows. As described in the Philadelphia's Green City, Clean Waters combined sewer overflow control plan, investing in converting 4,000 acres of cityscape to green infrastructure will not only reduce sewage pollution, but also provide multiple benefits to the community including: reducing annual heat-related fatalities, saving millions of kilowatt hours of electricity, reducing the city's cooling needs, improving air quality and increasing recreational opportunities. Philadelphia will pay back the loan through existing fee structures and other sources<sup>19</sup>.

### **Spotlight on Cost-Effectiveness**

One of the most important benefits of green infrastructure and water efficiency practices are their ability to save money by offering less expensive solutions to common water management problems. For instance, the city of Portland, Oregon spent \$8 million to subsidize downspout disconnections for homeowners and saved the city \$250 million in traditional gray infrastructure fixes to reduce sewer overflows. By committing to water efficiency, the city of Boston, Massachusetts was able to reduce its water consumption by one third, increase its customer base by two million people, and save \$500 million by eliminating the need to build a new water supply dam.

By investing in land protection, cities like New York are finding huge savings in water treatment costs. The city saved an estimated \$6 billion in capital costs to construct a new water filtration plant by investing \$600 million in land protection and restoration. A study by the Center for Urban Forest Research at the University of California-Davis found that for every 1,000 deciduous trees in California's Central Valley, stormwater runoff would be reduced by an estimated one million gallons, saving thousands in gray infrastructure costs.

By treating stormwater where it falls and using the water we have more efficiently, these practices relieve pressure on aging traditional infrastructure, protecting our clean water supplies and saving communities money.

*“The Broadway storm garden project is an excellent opportunity for our City to fix failing infrastructure in a way that is cost-effective and preserves dwindling water supplies.”* MAYOR MARY VERNER, SPOKANE, WASHINGTON

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of green infrastructure or environmentally innovative projects and were unable to take full advantage of Green Project Reserve funding. State law in Virginia, for example, prevented funding of green infrastructure stormwater projects<sup>20</sup>. Given that these bright green projects are already eligible for funding under federal law, removing such state barriers should be a priority<sup>21</sup>.

### **Grants, Not Loans**

Finally, some states chose to provide grants instead of loans for Green Project Reserve projects making it much easier for non-traditional partners, such as watershed groups, to take an active role in achieving cleaner water (ARRA required that states distribute at least 50 percent of their SRF funds as “grants”)<sup>22</sup>. Although ultimately, green infrastructure and water efficiency should be integrated into utility and community planning to the point that grants are not necessary, providing initial incentives for bright green,

innovative projects where there is financial need and where these projects warrant further demonstration is a wise use of federal dollars.

**Spotlight Project:** In North Carolina, the City of Raleigh and Wake County partnered to retrofit 10 firehouses and one Emergency Medical Service station with cisterns with a capacity of 2,000-4,000 gallons that will allow the stations to reuse rainwater for vehicle maintenance, irrigation, and fighting fires. The funds received by the city and county will not only employ local people for the installation, but are building the North Carolina green economy by contracting with firms based in the state. As Amy Hathaway, Project Engineer with the City of Raleigh states, “this represents another excellent opportunity for North Carolina to utilize innovative techniques to reduce the demand on our drinking water supplies by investing in cost-effective solutions.”



**Completed in the fall of 2001, the Heinz 57 Center was the first vegetated roof in downtown Pittsburgh. More than 18,000 plants cover the green roof retaining 55% of the yearly rainfall, cooling the building, and providing sweeping views for office residents. Photo credit: Roofscapes, Inc.**

# Recommendations

The Green Project Reserve represents a critical start to transforming our water infrastructure towards more sustainable approaches. Federal water infrastructure under the SRF programs can lead the way to provide multiple benefits and help communities achieve clean and safe water while also preparing for climate change. The lessons learned as part of the ARRA experience must guide future investments.

## NATIONAL

- **Fund and provide incentives for bright green approaches to clean and reliable water** — As illustrated by the unmet demand for the Green Project Reserve, there is a need to continue and increase funding for sustainable water infrastructure that uses bright green, innovative and water saving approaches to achieve safe and clean water and begin to better integrate these approaches into the front end of infrastructure planning. Congress should reauthorize the Clean Water and Drinking Water State Revolving Funds to include dedicated funding and incentives for the best bright green approaches. For instance, states that fund bright green projects with SRF funds should be able to waive their state match for those projects. Congress should continue to appropriate dedicated funds for green infrastructure and water efficiency and begin to emphasize brighter green approaches and specifically allow states to use additional subsidization for bright green projects. Finally, incentives for utilities that apply the bright green approaches as the backbone of climate adaptation planning should be established.
- **Continue to Improve EPA guidance for the Green Project Reserve** — Following an evaluation by EPA's Inspector General<sup>23</sup>, EPA has released revised guidance for spending Green Project Reserve money in FY10<sup>24</sup>. In addition to the good emphasis on prioritizing reinvestment in existing infrastructure over sprawl in its "fix it first" policy, the re-

vised guidance improves on the explanation of green infrastructure and makes clear that source water protection for drinking water supplies is eligible for Green Project Reserve funding. However, the guidance must be further updated to require that investment in energy efficiency be linked to the goals of the Clean Water and Drinking Water SRF. If this isn't changed then we run the risk that even more water infrastructure funding will be directed away from projects that fulfill the core goals of ensuring clean, safe, reliable water. Similarly, EPA needs to limit funds from being used to replace water meters and instead focus on installing first-time meters and on retrofit programs that will achieve real water savings.

- **Provide additional technical assistance and outreach** — Many states would benefit from additional technical assistance and outreach from EPA's staff with expertise in green infrastructure and water efficiency. Additionally, dedicating some of EPA's existing planning funds with the Green Project Reserve would assist communities in developing strong proposals ready for funding.

## STATES

- **Remove state barriers to funding a full range of sustainable approaches and adopt bright green project ranking criteria** — While the revised EPA guidance makes clear that state level prohibitions based on statute, regulation or policy cannot be used to justify insufficient Green Project Reserve applica-

tions, some state barriers clearly exist and prevent those states from achieving the full potential and Congressional intent of the Green Project Reserve. Some efforts are being made to remove such barriers<sup>25</sup>, but thorough review and targeting of state policies that prevent integrated infrastructure should be a priority. Additionally, many states are revising their project evaluation procedures and should adopt criteria that reflect broad environmental benefit, like restoring natural hydrology and achieving real water savings<sup>26</sup>. Already, EPA is working with several states as part of a multi-agency sustainability partnership to improve state project ranking criteria to ensure it better matches with sustainability principles, and this should be expanded.

- **Actively solicit new green reserve projects** — Vigorous outreach for new green reserve projects to a range of traditional and non-traditional partners will result in a wide range of strong projects, allowing states to select the most environmentally beneficial ones. States should receive additional money to administer the SRF programs if they are used for Green Project Reserve outreach.

- **Establish loan payback mechanisms for green projects** — Although many states chose to subsidize green projects under ARRA minimum subsidy requirements, the long-term ability to fund green projects depends on valuing these projects and creating loan payback mechanisms. In Pennsylvania, for example, the Green Project Reserve catalyzed the state's first green loan of \$30 million to Philadelphia, in part because the City could repay part of the loan out of its stormwater utility. A number of options for paying back loans for green projects exist, including park and recreation fees, linked deposit programs, and stormwater fees, and states should look to use these and other financing options<sup>27</sup>.

- **Transparency and consistency** — States should be required to clearly and publicly demonstrate how Green Project Reserve money is being used given that there is currently much variability between states. For instance, in states that relied on business case projects, there were challenges determining the nature of the project<sup>28</sup>. In contrast, states like New York posted every project with a project description on their website.

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## Conclusions

We must continue to transform our water infrastructure by using techniques that best leverage nature's abilities and use innovative technologies to ensure clean and safe water for people and rivers. The Green Project Reserve was an excellent first step in creating this change. States and EPA did a tremendous job under time pressure in shifting the approach to achieving clean and reliable water. Moving forward, the challenge is to make the best bright green projects and policies into normal, mainstream projects and policies. Such changes are necessary to help communities prepare for the impacts of a changing climate, including more frequent droughts and floods, and to ensure reliable clean water supplies for years to come.

# Appendix

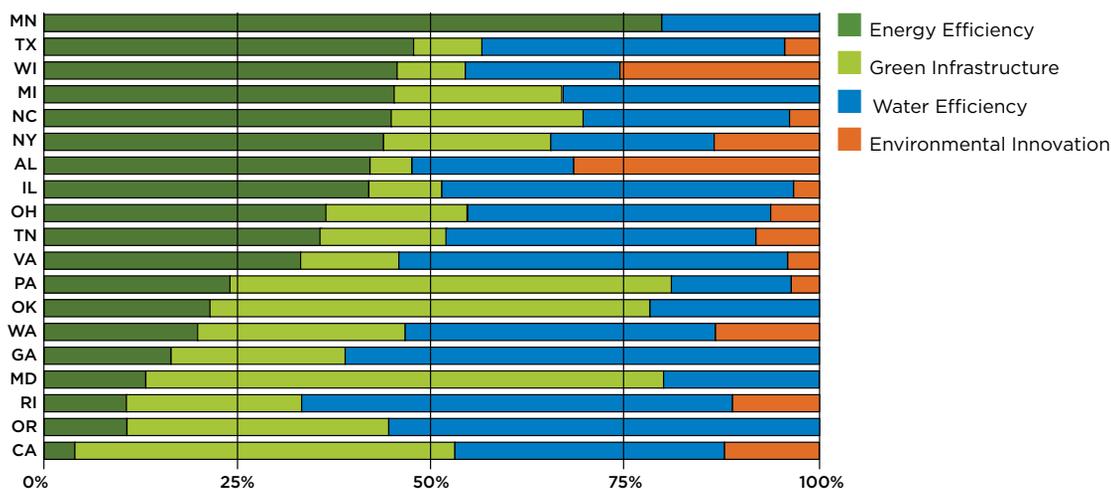
**TABLE A: Number and type of Green Project Reserve projects with bright green components in 19 states**

Bright Green Component	Type of Project					
	Clean Water		Drinking Water		All projects	
	funded	unfunded	funded	unfunded	funded	unfunded
Stormwater bioretention	42	29	0	0	42	29
Pervious surface	29	13	1	0	30	13
Wetland restore/construct/other	29	33	0	2	29	35
Stream/ creek restoration	23	25	0	0	23	25
Install first-time meters	1	0	19	26	20	26
Riparian/ habitat restoration	16	15	0	0	16	15
Green roof	14	8	0	0	14	8
Stream/river bank erosion control	13	5	0	0	13	5
Leak detection/ control	5	2	6	17	11	19
Low flow fixtures	4	5	1	7	5	12

**TABLE B: Number of funded Green Project Reserve projects with at least one bright green component in 19 states**

	Type of Project							
	Clean Water			Drinking Water			All projects	
	total	funded	un-funded	total	funded	un-funded	funded	un-funded
Number of projects with at least one Bright Green component	259	142	117	77	26	51	168	168
Total number of projects	757	393	364	711	254	457	647	821
Percent of projects with at least one Bright Green component	34%	36%	32%	11%	10%	11%	26%	20%

**FIGURE A: Distribution of EPA project types among funded projects in 19 states (Clean Water and Drinking Water SRF)**



# Footnotes

<sup>1</sup> U.S. Environmental Protection Agency, Clean Watersheds Needs Survey (2008) <http://www.epa.gov/owm/mtb/cwns/2008reportdata.htm> (last accessed Jun 4, 2010) and U.S. Environmental Protection Agency, Drinking Water Needs Survey and Assessment (2007) <http://www.epa.gov/safewater/needsurvey/index.html> (last accessed June 28, 2010).

<sup>2</sup> American Society of Civil Engineers, Report Card for America's Infrastructure. <http://www.infrastructurereportcard.org/> (2009).

<sup>3</sup> See note 1

<sup>4</sup> For more about the State Revolving Loan Funds, see U.S. EPA <http://www.epa.gov/owm/cwfinance/cwsrf/> and <http://www.epa.gov/safewater/dwsrf/index.html>.

<sup>5</sup> American Rivers and Alliance for Water Efficiency, Creating Jobs and Stimulating the Economy through Investment in Green Water Infrastructure, American Rivers and Alliance for Water Efficiency (2008).

<sup>6</sup> U.S. Environmental Protection Agency, Final Guidance for Award of Capitalization Grants by Funds Appropriated through ARRA, [http://www.epa.gov/water/eparecovery/docs/2009-03-02\\_Final\\_ARRA\\_SRF\\_Guidance.pdf](http://www.epa.gov/water/eparecovery/docs/2009-03-02_Final_ARRA_SRF_Guidance.pdf) (March 2009).

<sup>7</sup> U.S. Environmental Protection Agency, Clean Water State Revolving Fund, Green Project Reserve Funding Status, March 17, 2010 Update, Appendix Table 1, and EPA, Drinking Water State Revolving Fund, Green Project Reserve Funding Status, March 26, 2010.

<sup>8</sup> Id. Note that Kansas spent over 80% of its CWSRF funds on the green reserve.

<sup>9</sup> Winston Jones, WSA Gets \$300,000 for Toilet Rebate Program, Times-Georgian.com, [http://www.times-georgian.com/pages/full\\_story/push?article=WSA+gets+-300-000-+for+toilet+rebate+program%20&id=4671251-WSA+gets+-300-000-+for+toilet+rebate+program&instance=west\\_ga\\_news](http://www.times-georgian.com/pages/full_story/push?article=WSA+gets+-300-000-+for+toilet+rebate+program%20&id=4671251-WSA+gets+-300-000-+for+toilet+rebate+program&instance=west_ga_news)

<sup>10</sup> Mayer, Peter, et. al. National Submetering and Allocation Billing Program Study (2004).

<sup>11</sup> See e.g. David C. Trimble, Government Accountability Office, Recovery Act: Clean Water Projects are Underway, but Procedures May Not Be in Place to Ensure Adequate Oversight, Presented to House Committee on Transportation

and Infrastructure (May 26, 2010). Noting that Mississippi funded three large, high-cost energy efficiency projects to meet the Green Project Reserve.

<sup>12</sup> Aleksandra Robinson, Capital News Service, "Green Street" to Sop Up Tiny Towns Flood Problem <http://chesapeakebay.umd.edu/article/green-street-sop-tiny-towns-flood-problem> (Nov. 24, 2009).

<sup>13</sup> New York State Environmental Facilities Corporation, Green Innovation Grant Program <http://www.nysefc.org/home/index.asp?page=687> (last accessed May 18, 2010).

<sup>14</sup> Jennifer Smith, Rains No Match for Lindenhurst Library's Parking Lot, Newsday.com (March 30, 2010).

<sup>15</sup> California State Water Resources Control Board, Clean Water SRF Amended Intended Use Plan (April, 17, 2009) [http://www.swrcb.ca.gov/water\\_issues/programs/grants\\_loans/srf/docs/amnd08\\_09iup.pdf](http://www.swrcb.ca.gov/water_issues/programs/grants_loans/srf/docs/amnd08_09iup.pdf).

<sup>16</sup> Office of Governor Chris Gregoire, Gov. Gregoire approves Recovery Act funds for clean water projects in Spokane, Olympia, Ballard, <http://www.governor.wa.gov/news/news-view.asp?pressRelease=1385&newsType=1> (Nov. 29, 2009).

<sup>17</sup> Environment News Service, Recovery Act Funds Washington Stormwater Projects Worth \$5.6 Million, <http://www.ens-newswire.com/ens/nov2009/2009-11-30-091.asp> (Nov. 30, 2009).

<sup>18</sup> See e.g. Aspen Institute, Sustainable Water Systems: Step One – Redefining the Nation's Infrastructure Challenge (May, 2009), recommending that water infrastructure is redefined as integrating "built infrastructure components with the protection and restoration of its supporting natural watershed infrastructure and the use of emerging small-scale water technologies and water management solutions."

<sup>19</sup> Plan Philly, Green City, Clean Waters, <http://planphilly.com/node/9842> (last accessed May 18, 2010).

<sup>20</sup> Virginia DEQ, VCWRLF Loan Program Announcement, March 25, 2009.

<sup>21</sup> See e.g. U.S. EPA, Green Infrastructure Approaches to Managing Wet Weather Using Clean Water State Revolving Funds, [http://www.epa.gov/npdes/pubs/gj\\_cwsrf.pdf](http://www.epa.gov/npdes/pubs/gj_cwsrf.pdf) (July 2008) and Funding Water Efficiency Through the State Revolving Fund Programs, [http://www.epa.gov/owm/cwfinance/cwsrf/we\\_factsheet.pdf](http://www.epa.gov/owm/cwfinance/cwsrf/we_factsheet.pdf) (August 2003).

<sup>22</sup> David C. Trimble, Government Accountability Office, Recovery Act: Clean Water Projects are Underway, but Procedures May Not Be in Place to Ensure Adequate Oversight, Presented to House Committee on Transportation and Infrastructure (May 26, 2010). In a review of 12 states (some overlap with 19 states reviewed in this analysis), the Government Accountability Office found that 93% of the Green Project Reserve projects were awarded additional subsidization.

<sup>23</sup> U.S. Environmental Protection Agency, Office of Inspector General, EPA Needs Definitive Guidance for Recovery Act and Future Green Reserve Projects, Report No. 10-R-0057 (Feb. 2010).

<sup>24</sup> U.S. EPA Guidance documents were not available on EPA's website at the time of publication and are instead available at: [www.americanrivers.org/greenfunding](http://www.americanrivers.org/greenfunding).

<sup>25</sup> See e.g. Virginia House Bill 1221, allowing state SRF funds to be used for stormwater. The bill was amended to ensure that stormwater would be funded only after all wastewater treatment plants were funded <http://leg1.state.va.us/cgi-bin/legp504.exe?101+sum+HB1221> (last accessed May 10, 2010).

<sup>26</sup> See e.g. Northbridge Environmental Management, Alabama Clean Water State Revolving Fund, American Recovery and Reinvestment Act Lessons Learned: CWSRF Priority System Changes Needed to Address Green Project Reserve Funding (May 2010).

<sup>27</sup> Jeff Hughes, UNC Environmental Finance Center, Financing Green and Getting Paid Back, presentation at Council of Infrastructure Financing Authorities 2009 Conference [http://www.efc.unc.edu/training/2009/CIFA/Addressing\\_Green\\_Challenge.pdf](http://www.efc.unc.edu/training/2009/CIFA/Addressing_Green_Challenge.pdf).

<sup>28</sup> Steve Wise, Center for Neighborhood Technology, Before the Funding Well Runs Dry: Comparing States' Clean Water Green Reserve Process and Performance, presentation available at <http://www.cnt.org/repository/Before%20Wells%20Run%20Dry%20final%2010-13-09.pdf> (Oct. 2009).



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