BRIEF

State Policy Options for Green Infrastructure

THE RIVER WALK IN SAN ANTONIO, TEXAS.

Introduction

Minimizing the impacts of extreme weather events is a top priority for states. The federal government is increasingly prioritizing investments in mitigation, and in particular solutions characterized as natural or green infrastructure. States face competing budget priorities, and investing in pre-disaster mitigation sometimes competes with immediate response needs and other infrastructure concerns. Data on the benefits of natural hazard mitigation can inform states when investing in nature-based solutions and green infrastructure. The National Institute of Building Sciences published a 2021 report showing that every $1 invested in mitigation efforts yields a $13 return on investment. This data can be a powerful tool for states as they determine their spending priorities.

The U.S. Environmental Protection Agency recently estimated that upgrading aging stormwater and public wastewater systems throughout the country will require at least $150 billion over the next two decades. As states weigh their options, green infrastructure can offer a cost-effective solution to managing water infrastructure issues, including flooding and stormwater pollution. "Green infrastructure" refers to landscape features and solutions that mimic, use or restore natural ecological processes. These approaches are designed to minimize the impacts of flooding and reduce pollutants and debris that could enter waterways.

"Gray infrastructure" includes pipes, ditches, culverts and retention basins. Green infrastructure approaches can allow for water to be absorbed by soil and vegetation rather than flowing into groundwater or surface water resources, keeping water out of sewer systems and reducing sewer overflows. Green infrastructure can be implemented on its own or with gray infrastructure to provide cost-effective and sustainable solutions to a number of natural hazards, including drought, fire mitigation and flooding.

Green Infrastructure Approaches

Green infrastructure projects are an innovative approach to stormwater management that can protect water quality and increase a state's climate resilience. Projects can include:

Bioswales: Engineered landscape elements designed to increase infiltration of stormwater to the groundwater basin and filter out pollutants.

Green roofs: Vegetated roof with a layer of soil atop a drainage system to filter contaminants, absorb rainfall and delay runoff to reduce stress on stormwater systems, lower energy bills, reduce heat island effects and improve air quality.

Permeable pavement: Permeable pavers and porous concrete surfaces that allow water to penetrate pavement and soak slowly into the ground rather than run off into city drains.

Constructed wetlands: Human-made wetlands that mimic the stormwater capture and nutrient load reduction benefits of natural wetlands and treat waste and stormwater with specific vegetation, soils and bacteria instead of chemicals.

SOURCE: TAP INTO RESILIENCE

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In recent years, after evaluating their potential benefits, states have implemented green and natural infrastructure projects. States are increasingly adopting policies to develop, implement and fund green infrastructure projects and are integrating these into existing hazard mitigation plans.

Key Issues and Challenges

Financial challenges, regulatory barriers and a shortage of technical assistance make it difficult for states to fully implement green infrastructure projects, despite their proven economic and environmental benefits. Key challenges include:

- **Identifying common definitions:** States are defining green infrastructure in statute and outlining the types of projects included under this term. Definitions can clarify and improve understanding of the options for implementation and funding.
- **Communicating the value:** A lack of readily available data illustrating the benefits of green infrastructure can make communicating the value of projects to local governments and communities challenging.
- **Workforce development:** New and innovative projects often require a workforce with specific knowledge and skills. Investing in workforce capacity is essential to managing, operating and maintaining projects.
- **Funding:** Investing in green infrastructure can utilize traditional funding approaches and sometimes requires innovative financing solutions. Many states and the federal government are prioritizing these solutions and are creating funding programs and resources to support these investments. Green infrastructure and nature-based solutions were prioritized in recent federal legislation, including the Inflation Reduction Act and the Infrastructure Investment and Jobs Act.

HARVEY JONES CHANNEL, DURING PLANTING. SOURCE: RIO GRANDE RETURN

Definitions

The terms “nature-based solutions,” “green infrastructure” and “natural infrastructure” are sometimes used interchangeably.

“Nature-based solutions” generally describe practices that incorporate natural features or processes into the built environment. The Environmental and Energy Study Institute provides the following definitions as subcategories:

Green infrastructure: projects that combine gray infrastructure with nature-based solutions to create hybrid systems that improve resilience to climate impacts.

Natural infrastructure: projects that use existing or rebuilt natural landscapes (i.e., forests, floodplains and wetlands) to increase resilience to climate impacts.

The Water Infrastructure Improvement Act of 2019 defines green infrastructure as “the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters.”

SOURCES: ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL AND ENERGY STUDY INSTITUTE AND FEDERAL EMERGENCY MANAGEMENT AGENCY.

HARVEY JONES CHANNEL, AFTER WATER RELEASE. SOURCE: RIO GRANDE RETURN

Funding for Green Infrastructure

Created by the 1987 amendments to the Clean Water Act, the Clean Water State Revolving Fund is a key state-federal partnership to finance the nation's water infrastructure in in ways that allow states to prioritize their individual needs.

Many states are mandated by Congress to use revolving funds to support green infrastructure projects, such as green roofs and permeable pavements. The American Recovery and Reinvestment Act of 2009 provided supplemental appropriations for the water revolving fund programs, and Congress mandated states allocate at least 20% of these funds to a green project reserve to address water and energy efficiency or other environmentally innovative approaches. Subsequently, Congress extended the 20% reserve for green projects in the EPA's regular fiscal year 2010 and FY 2011 appropriations acts.

Since FY 2012, Congress has modified the requirement, specifying that, to the extent there are sufficient eligible applications, states allocate no less than 10% of their Clean Water State Revolving Fund capitalization grants for green infrastructure, water or energy efficiency improvements, or environmentally innovative activities through the green project reserve.

The Clean Water State Revolving Fund provides grants to the states, and historically, states contribute an additional 20% to match the federal grants, although that match requirement may be reduced or eliminated via an act of Congress, as was the case with the American Recovery and Reinvestment Act and the Infrastructure Investment and Jobs Act of 2021.

The Water Resources Reform and Development Act, signed into law in 2014, authorized new water infrastructure projects and mandated a series of reforms for the U.S. Army Corps of Engineers.

The EPA's Water Infrastructure Finance and Innovation Act Program is a federal credit program for eligible water and wastewater infrastructure projects. Unlike the state revolving funds, this EPA program provides direct loans at U.S. Treasury rates to eligible entities, including state financing authorities; federal, state, local or tribal governments; partnerships; or corporations. In using this EPA program, the maximum loan amount eligible to be financed is 49% of a project's total cost.

Under the American Rescue Plan Act of 2021, Coronavirus State and Local Fiscal Recovery Funds may be used to address the consequences of deferred maintenance in drinking water systems and the removal, management and treatment of sewage and stormwater, along with additional resiliency and climate adaptation measures.

The Infrastructure Investment and Jobs Act and the Inflation Reduction Act have prioritized funding for green infrastructure projects, including flood mitigation and stormwater management. For example, the infrastructure law authorizes $400 million for WaterSMART Water and Energy Efficiency Grants, including $100 million for natural infrastructure projects. States will continue to explore funding through these mechanisms.

Examples of recent state legislation:

Florida (**SB 2500**, 2021): $40 million to the Department of Environmental Protection in Fixed Capital Outlay for the water supply and water resource development grant program to help communities plan for and implement conservation, reuse and other water supply and water resource development projects.

Nebraska (**LB 1014**, 2022): $150,000 for the University of Nebraska to update the "Assessing Climate Change" report released in 2014, including identifying specific measures such as green infrastructure investments.

New Jersey (**FY 2023 Appropriations Act**): $20 million to the Department of Environmental Protection for greenway planning, development and remediation.

Vermont (**HB 740**, 2022): $31 million for stormwater retrofit projects to provide three-acre stormwater permitting design and construction support, and to provide design and construction for practices necessary to restore impaired waters subject to flow restoration plans.

Funding Mechanisms and Priority Setting

States can utilize traditional or innovative funding approaches. Examples of funding mechanisms states have put in place to support green infrastructure projects:

Arizona (**SB 1740**, 2022): Created a water conservation grant program to fund projects aimed at improving water use efficiency and reliability, including green infrastructure projects.

The District of Columbia (2018) **created** the Green Finance Authority to increase private investment in clean water, stormwater management and green infrastructure projects.

Florida (SB 976, 2021): Encouraged new approaches and financing mechanisms for the protection of the state's wildlife corridor, including public-private partnerships, payments for ecosystem services, and blended financing for resilience and green infrastructure.

Louisiana (HB 2, 2022): Appropriated over $3 million to the Lower Ninth Ward Green Infrastructure Project.

Maryland (HB 653, 2022): Specified that the maintenance and repair of source watersheds, including the installation and maintenance of green infrastructure that improves water quality, is eligible for the same forms of financial assistance as other water collection and treatment infrastructure. The bill also defined green infrastructure as "a land-based natural area or natural feature, or a system or feature designed to protect, mimic or enhance a natural function, that: absorbs and filters pollutants; protects communities from flooding or storm surge; reduces erosion; or sequesters carbon."

The **New Jersey** Department of Environmental Protection and the state Infrastructure Bank partnered to administer the New Jersey Water Bank, which provides low-cost financing for water projects, including green infrastructure. The Infrastructure Bank was established under the New Jersey Infrastructure Trust Act as an independent state financing authority.

Project Implementation with Resiliency Planning

States have incorporated green infrastructure approaches, such as flood mitigation and stormwater management practices, into climate and coastal resiliency planning.

State examples:

California (**AB 72,** 2021): Required the Natural Resources Agency to explore and implement options to establish a more coordinated and efficient regulatory review and permitting process for coastal adaptation projects that use natural infrastructure.

SB 170, 2021: Allocated funding to support regional climate adaptation planning and action plans. The bill specifies the plans shall use natural infrastructure to respond to climate vulnerabilities where feasible.

Florida (**SB 712**, 2020): Required the Departments of Environmental Protection and Economic Opportunity, in cooperation with local governments in coastal areas, to develop a model stormwater management program that could be adopted by local governments. The program must contain ordinances that target nutrient reduction practices and use green infrastructure.

Virginia (**HB 516**, 2022): Specified that the Virginia Coastal Resilience Master Plan must be updated at least every five years and must recognize the importance of protecting and enhancing natural infrastructure and nature-based approaches to flood mitigation when possible.

Green infrastructure approaches can protect healthy watersheds and reduce the risks of extreme weather events. Current opportunities to use federal dollars will help states address some of the challenges as policymakers seek to implement these projects.

ADDITIONAL RESOURCES

NCSL Resources

- NCSL, ARPA State Fiscal Recovery Fund Allocations
- NCSL, Environment and Natural Resources Bill Tracking Database

External Resources

Please note that NCSL takes no position on state legislation or laws mentioned in linked material, nor does NCSL endorse any third-party publications; resources are cited for informational purposes only.

- Environmental Protection Agency, What is Green Infrastructure? ARRA CWSRF Green Project Reserve Report
- EPA, Overcoming Barriers to Green Infrastructure
- Environmental and Energy Study Institute, Infrastructure Policy and Programs: Nature Based Solutions
- Environmental Defense Fund, Evaluating Best Practices from State Revolving Funds to Support Market- and Nature-Based Approaches for Flood Risk Reduction and Water Quality Improvement
- Environmental Policy Innovation Center, Financing Green Stormwater and Natural Infrastructure with Clean Water State Revolving Funds
- Federal Emergency Management Agency, Nature-Based Solutions
- Georgetown Climate Center, How to Pay for Green Infrastructure: Funding and Financing
- Georgetown Climate Center, Communication Strategies for Green Infrastructure

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