

A Critical Moment To Harness Green Infrastructure—Not Concrete—to Secure Clean Water



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Natural ecosystems [provide essential services](#) for our communities. Forests and wetlands, for example, [filter the water](#) we drink, protect neighborhoods from floods and droughts, and shade aquatic habitat for fish populations.

While nature provides this “[green infrastructure](#),” water utilities and other decision-makers often attempt to replicate these services with concrete-and-steel “gray infrastructure”—usually at a much greater cost. Particularly where the equivalent natural ecosystems are degraded, we build filtration plants to clean water, reservoirs to regulate water flow, and mechanical chillers to protect fish from increasing stream temperatures. And even though healthy ecosystems can reduce the operational costs of these structures, investing in restoring or enhancing various types of green infrastructure is rarely pursued—either as a substitute for or complement to gray infrastructure.

Despite America’s history of reliance on gray infrastructure, now is a critical time to tip the scales in favor of a [green infrastructure approach](#) to water-resource management. Investing in the conservation and improved management of natural ecosystems to secure and protect water systems can keep costs down and create jobs. Green infrastructure can also provide a suite of co-benefits for the air we breathe, the places we play, the wildlife we share our landscapes with, and the climate we live in.

The Time Is Ripe for Green Infrastructure

In the United States, most gray infrastructure was built 40-50 years ago with large federal grants and few provisions for maintenance. This aging infrastructure needs significant investment to keep pace with population growth and to repair wear and tear.

Yet funds for investment in water infrastructure are drying up in an era of fiscal austerity. Naturally, water utilities, reservoir managers, and storm water managers are seeking lower-cost solutions to meet water demands of the 21st century.



Oregon is one state that's investing in green infrastructure including in the Rogue River Basin, shown here. Photo credit: Flickr/cfinke

Green Infrastructure's Success Stories

Since the [landmark green infrastructure investment](#) in New York City's Catskill-Delaware watershed in the late 1990s, there have been several similar breakthroughs across the United States. These cases illustrate how green infrastructure can provide clean water and other services at a lower cost and with greater benefits than traditional gray infrastructure. Just a few examples include:

- **Denver, CO** is [investing](#) in thinning and other fire risk management measures in its forested watersheds. Wildfires in Denver's headwaters can cause massive sedimentation, which can clog the utility's water intakes, reduce reservoir storage capacity, and increase treatment costs. Managing for fire risk also improves watershed function and reduces risk to local homes, wildlife, and fisheries.
- **Medford, OR** is [saving an estimated \\$12 million](#) by investing in [riparian forest restoration](#) to shade streams instead of installing mechanical chillers to meet its Clean Water Act obligations related to stream temperature. Riparian forest also provides benefits for habitat, carbon sequestration, and water quality.
- **Portland, OR** is saving an estimated \$200 million by prohibiting logging in most of its [Bull Run watershed](#). The city is closing logging roads and removing culverts and other infrastructure in order to maintain downstream water quality and secure ancillary benefits for wildlife. This investment has helped Portland to secure clean water and thereby qualify for a filtration avoidance waiver from the U.S. Environmental Protection Agency (EPA), saving the utility the cost of a new filtration plant.

Barriers to Expanding Green Infrastructure

Despite the growing number of success stories, the practice of green infrastructure investment has yet to reach scale, [leaving substantial opportunities](#) for enhanced services and cost savings unrealized.



The struggle to get to scale can be associated with a long list of institutional challenges, including knowledge gaps and old habits of defaulting to gray infrastructure. For example, water utilities are largely staffed with engineers trained to build gray infrastructure. Accounting standards currently do not allow water utilities to use the same finance mechanisms for natural capital that are typically available for gray infrastructure. And key enabling agencies like the U.S. EPA are sometimes slow to sanction innovative solutions like green infrastructure, due to standard operating procedures that often favor gray infrastructure.

New Guide on Investing in Green Infrastructure

WRI expects to release its new guide, "Investing in Green Infrastructure for Source Water Protection," later this year. The focus in this publication is on ecosystem-based provisioning of clean water, although much of the guide has broader relevance. The guide threads together the insights of leading green infrastructure experts and practitioners into a comprehensive resource that will help water resource decision makers do the following:

- Identify characteristics of watersheds "ripe" for green infrastructure investment;
- Understand the scientific foundation underlying the approach;
- Make the business case for green infrastructure;
- Identify key players and elements of the stakeholder engagement process;
- Identify potential finance mechanisms for green infrastructure; and
- Draw key takeaways from early green infrastructure success stories.

Restoring riparian forest can help filter water and keep stream temperatures cool. Photo credit: Wikimedia Commons/Minnecolgies

Pushing for a Tipping Point

However, there are encouraging signs that the green infrastructure approach is nearing a tipping point in the United States. The [American Water Works Association \(AWWA\)](#) is increasingly engaged with its member utilities in the area of “source water protection” which often centers on green infrastructure. Major cities like Denver, New York, Philadelphia, and San Francisco are starting to test out green infrastructure for water management, acting as models to inspire and educate other communities. And a growing number of conservation groups are now specializing in the development and implementation of green infrastructure investment programs.

There’s also a push to provide more resources to help water utilities and other decision makers invest in green infrastructure. At the recent [ACES and Ecosystem Markets Conference](#)—which brings together the science, practical, institutional, and decision-making sectors of the ecosystem services community—WRI announced a forthcoming document for green infrastructure investment, a joint effort with [Earth Economics](#) and the [Manomet Center for Conservation Sciences](#). With working title “Investing in Green Infrastructure for Source Water Protection,” this guidance document is intended to provide water utilities, local conservation groups, and private businesses with a persuasive case, a road map of next-steps, and overarching guidance to integrate green infrastructure into decision-making. The guide is set to be released in 2013, and is just one part of a broader push by WRI and our partners to bring green infrastructure investment to a tipping point.

We’re in a critical moment—natural ecosystems continue to degrade, existing gray infrastructure continues to age, and climate change continues to rise. Even if just a portion of upcoming water infrastructure investment is directed toward green infrastructure, the opportunities for cost savings and water-related benefits are immense.

TAGS: [ecosystem services](#), [green infrastructure](#), [united states](#), [water](#), [watersheds](#)

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