

DELAWARE RIVER WATERSHED INITIATIVE CASE STUDY



Can a Water Fund Bring New Dollars for Watershed Restoration?

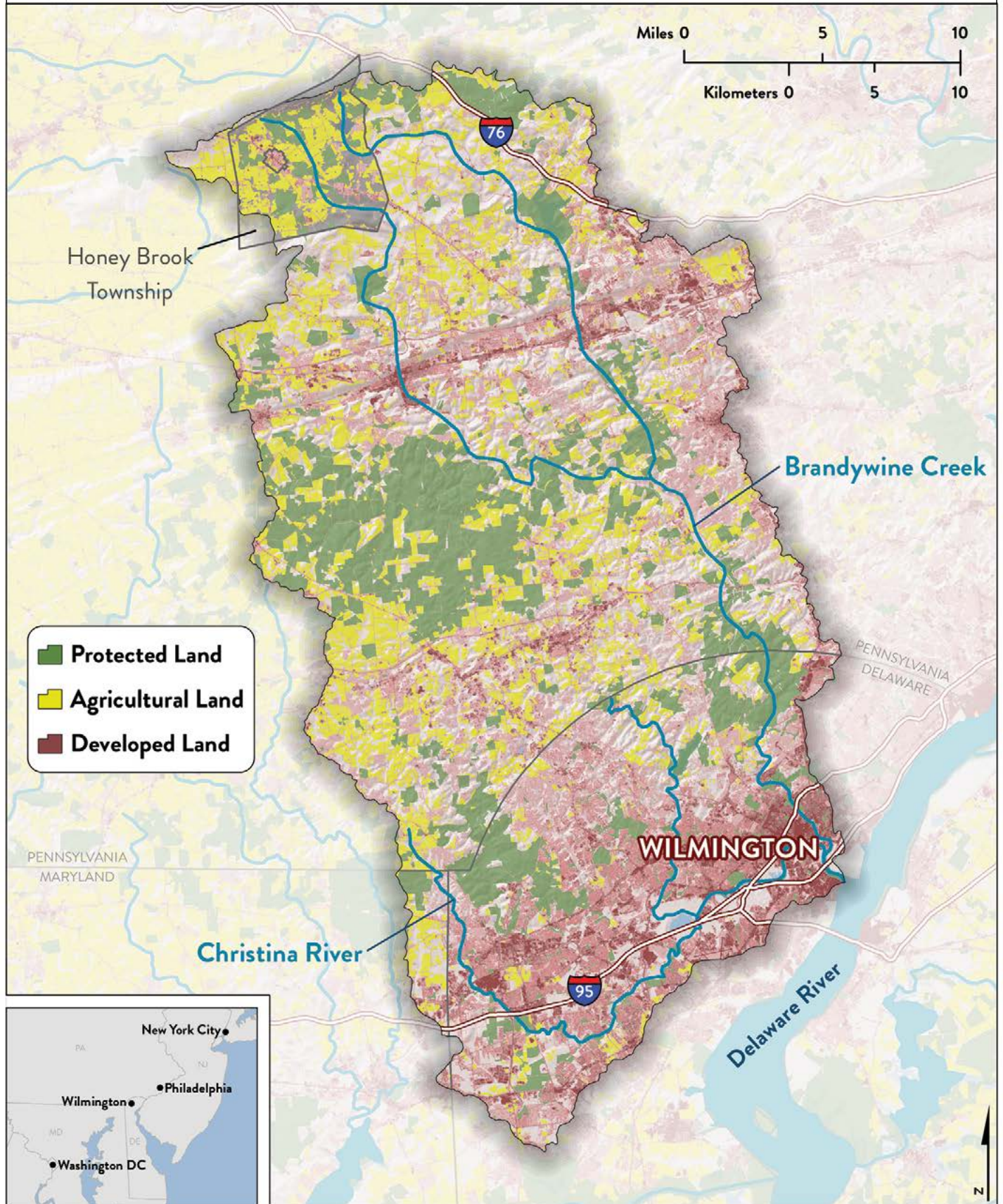
The Delaware River Watershed Initiative, an ambitious effort to protect and restore water quality for 15 million people throughout the basin, comes with equally ambitious funding needs. At least \$190 million is needed in the initiative's focal sub-watersheds to maintain and improve water quality by 2024.

The Brandywine-Christina
Water Fund will use an innovative
“pay-for-success” model

In the Brandywine-Christina watershed, one of the eight focus areas, a partnership of conservation organizations, public and private utilities is seeking to build on a few million dollars in foundation support by establishing a \$1.5 – \$10 million revolving local water fund to catalyze upstream restoration work. If they succeed, the effort could serve as a model for other places that need a sustainable source of local funding for watershed restoration.

This case study, the fourth in a series by the Open Space Institute on best practices to protect and restore watersheds, focuses on the potential of the Brandywine-Christina Water Fund. The series, generously funded by the William Penn Foundation, complements the work of OSI's Delaware Watershed Protection Fund, which has provided \$9 million to protect almost 20,000 acres of important watershed lands throughout the basin.

LAND USE IN THE BRANDYWINE-CHRISTINA WATERSHED





INTRODUCTION

In 1995, the Christina River Basin Water Quality Committee was created out of concern for declining water quality and meeting the needs of a growing population. In 2009, after tracing excess nitrogen in its water supply back to farms 40 miles north of the city, the City of Wilmington began earmarking \$10,000 for farmland protection in the Honey Brook section of Pennsylvania's Brandywine Valley. While the city now spends about \$40,000 annually for riparian plantings and other best management practices on farms there, a more comprehensive approach is needed and more dollars. The once largely forested Brandywine-Christina watershed, which provides water to 600,000 residents, is now almost 27 percent farmland and 50 percent urbanized. In and around Wilmington and Philadelphia, the pressures of development and agriculture are compromising water quality. Nevertheless, the area still has high-quality streams and habitat for brook trout and other wildlife. An assessment in 2014 determined that \$15 million was needed for near-term actions to protect land, restore streams and help local governments develop land-use policies compatible with watershed goals.

The challenges in the Brandywine-Christina are common to many areas of the United States: working across multiple jurisdictions, halting land degradation, and protecting still-intact areas. Over the next several years, the Brandywine-Christina Water Fund seeks to address some of these challenges using an innovative "pay-for-success" model that seeks to attract public and private funds for measurable decreases in pollution. Several obstacles must be overcome, but the approach has potentially far-reaching implications for how watershed restoration is funded.



WATER FUNDS

Advocates for local food movements often lament that consumers do not understand where their food comes from. The same could be said about water: we take for granted the clean, drinkable water that flows from the faucet.

Water utilities combine sophisticated engineering and chemistry to deliver clean water to communities around the clock every day of the year. When you pay your water bill, you are paying for pipes and other equipment, chemicals to treat water, people to run the operations and electricity to run pumps and filters. But what your water bill typically does not cover is the protection or maintenance of the watershed—the forests that filter and deliver a steady supply of clean water. Water funds direct some dollars toward these lands.

“An estimated two-thirds of the fresh water in the U.S. originates in forests. Forests act as natural filtration systems, helping clean our drinking water supplies. When forests are converted to other uses, these filtration services may diminish, which may trigger the need for new, more costly treatment alternatives.”

— Peter Stangel,
U.S. Endowment for Forestry and Communities

A water fund creates a sustainable source of funding by collecting money from downstream water users and transferring it to upstream communities to spend on watershed protection, stewardship and restoration. Such green infrastructure solutions are typically cheaper than hard infrastructure like multimillion-dollar treatment plants. The downstream water users benefit from the upstream improvements, and because the downstream users are typically numerous, the financial burden is shared among many (*Figure 1*).

The idea of a water fund can be traced to the 1800s, when water utilities and their communities decided to protect watershed lands to secure public water supplies. Philadelphia is credited with creating the nation's first municipal water works in 1801. Continuing water quality problems encouraged the city in 1855 to conserve upstream lands to protect water supply. The lands became Fairmont Park preserving “the purity of Schuylkill water from the possible pollution which might result if buildings were constructed adjacent to the Fairmount Water Works” (Geffen, E. 1982).

Funding for watershed protection continued throughout the 20th century. In the early 1990s Rhode Island began conserving land for drinking water through a statewide program that apportions one cent for every 100 gallons of water use toward watershed protection. The fee generates around \$2 million each year for land conservation. In 1996 North Carolina created the Clean Water

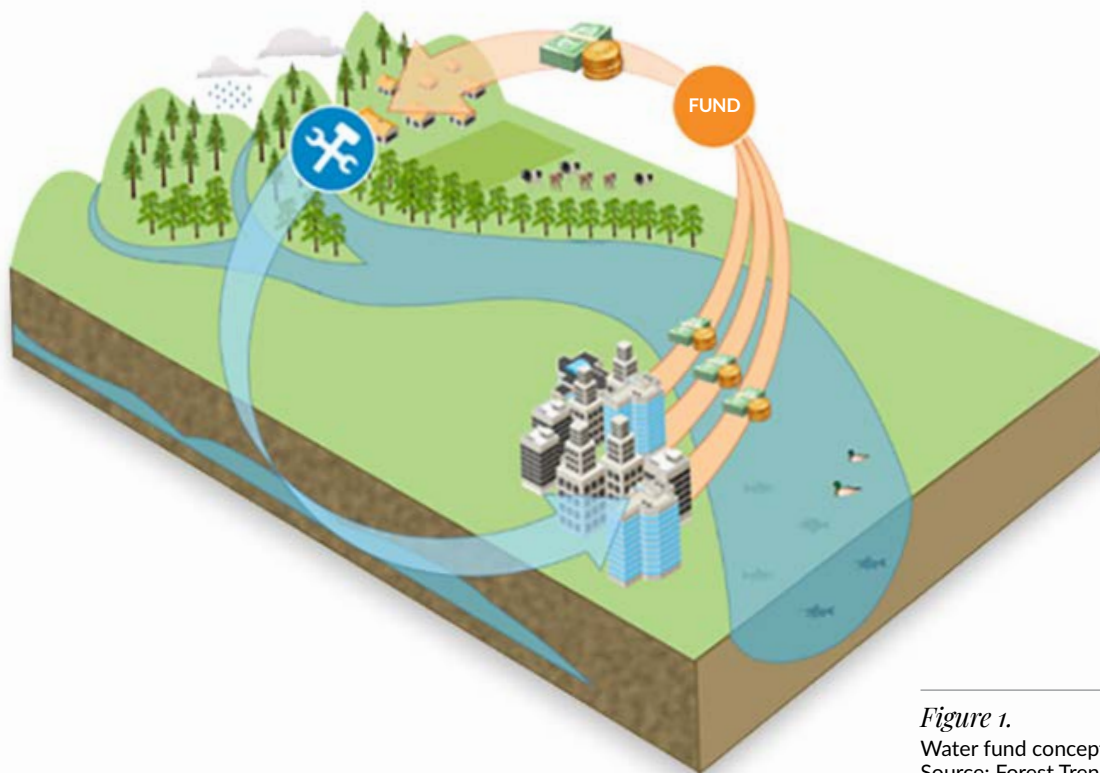


Figure 1.
Water fund concept.
Source: Forest Trends.

Management Trust Fund, a statewide program that supports not only protection but also restoration and innovative stormwater management. The fund has helped protect more than 500,000 acres and 2,500 miles of streams across the state. It is not a dedicated fund—the dollars come mostly from the state’s general fund—but it has been critical to matching local watershed efforts like the Upper Neuse Clean Water Initiative. This local water fund generates just over \$2 million a year for watershed protection by allocating 15 cents for every 1,000 gallons used by residents in the Raleigh area.

Local water funds are a relatively recent phenomenon but number at least 25, with several more, including the Brandywine-Christina, in development (see appendix, page 12).

Most are informal: utilities simply choose to use a portion of their revenue for watershed protection. As many as 12, including the one in Raleigh, appear to have a dedicated separate fee for watershed protection. Funding is generally modest—about half collect less than \$2 million per year—but the amounts add up, can grow over time and have been used to protect thousands of acres and miles of streams.

Outstanding examples include Bellingham, Washington, which passed an ordinance in 2000 allowing the utility to charge up to \$5 a month per user for watershed land acquisition. This water fund generates about \$5 million per year from 90,000 water users and has protected more than 2,000 acres. And Austin’s Water Quality Protection Land Program has conserved 26,000 acres since 1998.



VALUE PROPOSITION

What is the return on the investment by water funds? The classic case for watershed protection comes from New York City. In the late 1990s, the city determined that it could spend either \$6 billion on infrastructure to treat water or \$2 billion on conservation to ensure water quality by keeping upstream lands from being developed. The \$4 billion savings made a compelling case for watershed protection. Since 1997 the city has spent around \$500 million to protect some 140,000 acres in the watershed and support programs to maintain or improve watershed health.

New York is among the few cities to have received a filtration avoidance determination (FAD) from the Environmental Protection Agency, based on its ability to meet water quality criteria without filtration. The city has maintained a FAD since 1993 and renewed its waiver in 2017. Motivation to protect upstream forests is high: losing that FAD would now cost the city more than \$10 billion. For similar reasons, Portland, Maine, began a watershed protection program in 2008 (and a water fund is in development there). Other cities with FADs include Boston and San Francisco.

In the West, megafires provide additional rationale for protecting forested watersheds. Large fires pollute watercourses with ash and eroding sediment, and in a worst-case scenario, water pipes can melt. Preventing such a catastrophe could therefore

save millions on infrastructure. Water funds in Colorado, Arizona and New Mexico are being used to thin forests or set controlled prescribed burns to reduce fire risk. The Rio Grande water fund is one of the most recent. Created in 2014 and managed by The Nature Conservancy, the fund has secured more than \$3.5 million in private funding and has leveraged an additional \$30 million from the U.S. Forest Service and other agencies for forest stewardship practices on public lands. Together the partners have now treated 70,000 acres toward their 600,000-acre goal.

Where waterways are already impaired, the focus is restoration. Nonpoint sources of pollution, like urban and agricultural runoff, contribute sediment plus nutrients, like nitrogen and phosphorus, which can create algal blooms with potentially toxic effects on water supplies. Agricultural lands can be a major culprit: in the Toledo metro area in 2014, the water supply had to be shut off temporarily because of such blooms. But agricultural lands may also be cheaper to address. This is the basic premise behind the Brandywine-Christina water fund—that best

“The seemingly lofty goal of preserving this very large and significant watershed for future generations is well within grasp once the problem is broken into manageable pieces and the cost is shared equitably.”

— Savannah River Clean Water Fund

management practices (BMPs) on agricultural lands are a cost-effective means to reduce pollution. Riparian forest buffers and other practices, such as manure management, grass waterways, filter strips and windbreaks, will allow farmers to keep their land in production while reducing nonpoint source pollution.

Some water funds use a combination of practices. The water fund created in 2016 in the Beaver Lake Watershed in Arkansas finances forest protection and stream restoration but also “stewardship endowments” to maintain protected lands. A triple-bottom-line economic study (Sham et al. 2016) showed that a watershed protection plan would cost \$287 million but yield \$412 million in benefits. The cost of no action would be \$40 million. Among the strategies, forest protection was particularly cost-effective, with every \$1 spent yielding \$7 in benefits, including water quality, recreation and carbon sequestration. Another example: the Maui Watershed Protection Grant Program contributes an average of \$700,000 annually toward controlling invasive species—through either eradication or fencing—that damage the island’s protected watershed lands.

Most water funds rely heavily on public funding. Their managers have convinced communities, utilities and public natural resource agencies that protecting watershed lands secures the future of

But what happens when you try to attract private investors to support a water fund? The answer is that it gets a little more complex.

the region’s water and that a water fund will not be a large burden on water users. This case was made effectively to create the Savannah River Clean Water Fund in 2016. Five water utilities and many other partners worked together in Georgia and South Carolina to identify the highest-priority forests that would maintain the health of the watershed. They estimated the costs of protecting 210,000 acres of forest at \$135 million, with an additional \$15 million needed to encourage stewardship and forest certification on 960,000 acres of adjacent lands. The plan is to use public funding from federal and state sources to cover at least \$75 million. Water users across the watershed will contribute the additional funds over a 25-30-year time horizon with annual protection goals of 8,000 acres. The cost to water users will be less than \$1 a month.

PAY-FOR-SUCCESS

The Brandywine-Christina Water Fund takes a pay-for-success approach. Pay-for-success has been used in Washington, D.C., to generate funds for green stormwater infrastructure practices but is still a new idea in conservation finance. Three features make this water fund both unique and complex: it is a revolving fund; it targets watershed restoration projects across multiple jurisdictions, i.e., it operates at a watershed scale; and it seeks to involve private investors.

Investors will initially capitalize the fund, which will support agricultural Best Management Practices (BMPs) on private farmland in the upper reaches of the Brandywine-Christina watershed. The resulting pollution reductions will be quantified and translated into standardized environmental improvement units (EIUs). Those units will then be sold to downstream communities and utilities and used to meet regulatory requirements for clean water. Revenue from the sale of EIUs will repay the initial investors and replenish the fund for the next round of BMPs and the cycle continues. The goal is to use a modest investment of private capital to create an \$1.5-10 million fund (*Figure 2*).

BRANDYWINE-CHRISTINA WATER FUND CONCEPT

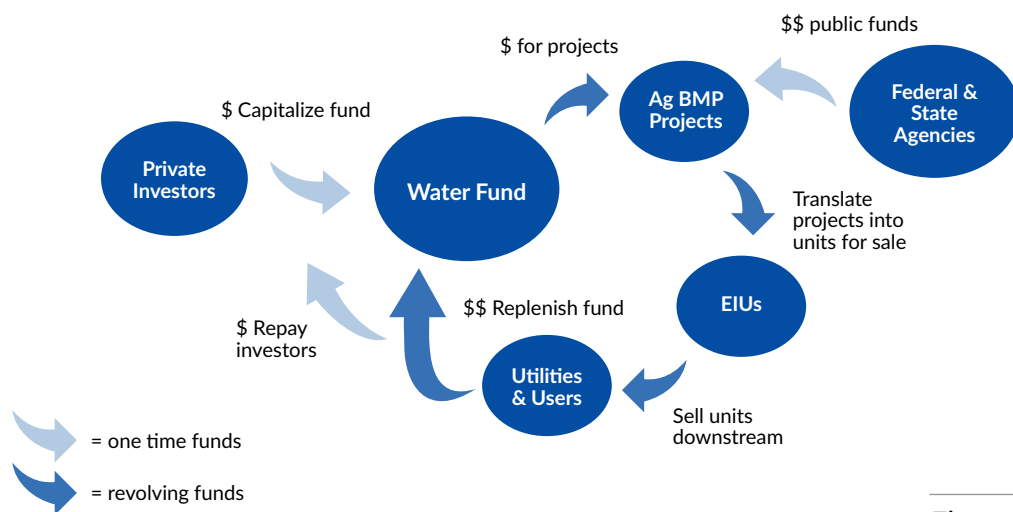


Figure 2.
Pay-for-success
fund concept

“The Brandywine-Christina Water Fund aims to harness outside investment to catalyze a self-sustaining, revolving fund that will expand water-quality conservation to the watershed scale. Nothing quite like it has ever been attempted, but if we get it right, the model will be readily adaptable to other watersheds in the DRWI and across the country.”

— Richie Jones, *The Nature Conservancy of Delaware*

The fund concept is a promising approach because it:

- Attracts outside private investors.
- Provides capital up front to implement the practices on the ground.
- Creates a mechanism for a revolving fund, so investors theoretically need to capitalize the fund only once.
- Moves downstream dollars across jurisdictional lines to the upstream places where BMPs will be most cost-effective, thereby making the watershed investment efficient.

The approach hinges on a few conditions which also present obstacles to overcome:

- Regulatory drivers. Downstream communities, which must comply with Clean Water and Safe Drinking Water Act requirements, may choose to participate only if the arrangement helps them secure Municipal Separate Storm Sewer (MS4) National Pollutant Discharge Elimination System (NPDES) permits.
- Fund creation and replenishment. The fund must attract outside investors who support the concept of positive environmental impacts that also deliver attractive financial returns which traditionally are hard to align. The municipalities and utilities must be willing to pay enough for pollution reduction both to repay the investors and to replenish the fund for another round of BMPs. The fund assumes it's offering them a bargain, given the higher costs of traditional approaches to reducing pollution in urban areas, or even green stormwater infrastructure — pervious pavement, rain gardens, bioswales, etc.
- Documented improvement. The pollution reductions must be well documented and organized into units that can easily be sold. The modeling that identified target sites for restoration was based on studies of BMPs in other watersheds. The results of the BMPs in this watershed must be validated before the program can be scaled up.
- Project pipeline and location. Enough willing landowners need to be engaged and agree to install and maintain the BMPs on their lands to generate units to sell. If projects are delayed, funds will not

flow and revolve. Working with multiple jurisdictions requires coordination. Utilities and municipalities need to support projects outside their boundaries.

The Brandywine-Christina Water Fund's value proposition has two parts.

First, that upstream restoration using agricultural BMPs is cheaper and more effective at reducing pollution than fixing the downstream consequences of urban and suburban development. The program's focus on watershed restoration is what makes the pay-for-success approach possible: the pollution reductions are expected to be significant and measurable.

Second, that downstream utilities and communities will value these environmental improvements and be willing to pay for them. This is how the program proposes to tackle the thorny issue of improving watershed health across multiple jurisdictions and use a market mechanism to catalyze investment.

Will it be successful? It is too soon to tell and there is still much work to do, but we should know by 2023, when permits for the local jurisdictions come up for review.

Because the Brandywine-Christina fund concept involves selling what sounds like pollution reduction credits, some might call it water quality trading—an approach that has been tried elsewhere but not widely adopted. The EIUs are not pollution credits, however, because they are not tied to offsetting new pollution. Rather, they are the mechanism for funding efforts to address existing pollution. Another difference is scale. Whereas many trading programs are broadly applied across very large areas, this fund finances interventions in six focal areas of the subwatershed, and it must show improvements tailored to that local scale.

If the result is a restored watershed in compliance with the Clean Water Act, how the fund is categorized matters less than improved water quality and the fund's ability to attract private capital to help turn the crank.



LESSONS LEARNED

Water funds are generally used to protect forests and streams that are still in good condition, particularly in source water areas, through land conservation and stewardship practices. This preventive approach is easy to understand. But if water funds are so conceptually simple and appear to work, why aren't there more of them? The United States has an estimated 4,000 water suppliers in urban areas and 50,000 in rural areas, yet fewer than 100 have created or actively participate in a water fund.

Funds geared toward protection are not without their challenges. Conserving land that is already in good condition may not actually reduce pollution, for example. Any improvements in water quality are hard to attribute, and fund managers can only model the avoided pollution. Nevertheless, recent research on forest protection in the Chesapeake Bay (Chesapeake Bay Commission, 2013) has made a convincing case for giving protection credit under the total maximum daily load (TMDL) requirements of the Clean Water Act. That suggests that a pay-for-success model could work for forested watershed protection as well.

Although water funds have also been used to restore riparian lands to improve water quality in streams, the Brandywine-Christina Healthy Water Fund may be unique in its exclusive focus on restoration. It is also operating in a complex regulatory context, which may present challenges in attracting private capital because of the higher level of scrutiny and due diligence required by investors.

To be effective in creating and maintaining water funds, whether for protection, stewardship or restoration activities, practitioners need to address each of the following:

Engaging utilities. Water utilities have a vested interest in watershed protection. As they try to deliver good service while keeping costs down, they may be open to cost-effective solutions. They also plan far into the future and may be fully aware of the pressures on their water sources and future infrastructure needs. The American Water Works Association encourages utilities to develop source water protection strategies based on a set of standards, and many do. Working with a utility requires understanding their motivations, political and geographic contexts. Is it concerned about water quality or quantity or both? Is it planning large infrastructure investments? Why? How much of the watershed does it own already or want to acquire? Conserving a watershed may require a water fund engaging multiple utilities. This is what the Brandywine-Christina fund is attempting to do, with five municipalities and utilities. In North Carolina, the Foothills Conservancy and its partners are working with the 18 water utilities that share the Catawba-Wateree watershed, which serves the Charlotte metro area, to establish a water fund. Building these relationships may not be easy and will take time but cultivating those key staff can be essential to a water fund and watershed-scale results.

Science and metrics. It is essential to establish the watershed benefits that come from protection, or restoration in the case of the Brandywine Christina, and to do so you need solid science. New data and technology have made it possible to identify and track pollutant loads, and measure their response to interventions in, say, forest protection or improved farm practices. The Brandywine's interest in developing environmental improvement units (EIU) represents an ambitious effort to use science to quantify changes in water quality, which could then be monetized.

“Water utilities are run by engineers and accountants. They want to do what has succeeded before. When there is high uncertainty, they become uncomfortable. Help them deal with that uncertainty plus understand where all the benefits are.”

— *Bob Morgan, Beaver Water District, Arkansas*

Business case. If the utility is considering a rate increase to create a dedicated fund, it needs to know how much funding is needed. Economic studies can document the value of watershed protection. A recent study for the McKenzie River water fund being developed in Eugene, Oregon, found a \$470 return on investment for every protected acre per year. The benefits of protection usually far outweigh the costs, but a study could also compare protection with traditional infrastructure. To manage risks, utilities often seek to control those aspects of the system that they can reliably influence—like engineered infrastructure or chemical solutions whose future costs can be projected with confidence. Creating a water fund may require demonstrating that landscape-scale solutions will be cost-effective, and that the numbers add up.

Shared funding. Water funds move downstream dollars from many water users to upstream projects, but in practice, even with contributions from water utilities, most water funds also need support from federal and state sources, often for purposes not specific to water. The Savannah River fund plans to secure 50% of its funds from such sources, and the Upper Neuse Clean Water Initiative relies heavily on state funds for matching dollars. According to numerous public polls, a major reason people vote to tax themselves to support open space conservation funding ballot measures is, quite simply, water. Of course, protected watersheds deliver numerous benefits beyond water quality, such as recreation, wildlife habitat and forest products. The additional interest groups can make for a complicated mixture of funding, but the leverage and synergy reassure utilities and water users that they are not shouldering the entire burden.

Capacity. Eastern watersheds are mostly privately owned. Engagement with these landowners can be one on one, parcel by parcel, or in tandem with local governments and planners, but in all cases requires capacity. Water funds also need capacity for centralized coordination to smooth the flow of water fund dollars over the long term of the initiative. And they must be able to monitor progress for adaptive management, among other specialized skills. Water funds sometimes pay for some of this capacity, which in turn provides a service to all parties.

Pipeline of projects and dollars. Successful water funds protect or restore land every year. The need to create a pipeline of projects is no small challenge, but the advantage of a locally supported water fund is having cash on hand to make projects happen as need and opportunity arise. Federal and state funds, by contrast, are typically subject to annual appropriations and are never guaranteed.



APPENDIX

U.S. Water Funds

State	Water Fund	Number of Users	Separate Fee	Approximate Annual Revenue	Revenue to Date	Year of Introduction	Use of Funds
Local Water Funds							
AR	Beaver Water District	500,000	Yes	\$750,000.00	\$1,500,000.00	2016	Program Admin, Land Acquisition, Easements, Stream Restoration, Stewardship
AR	Central Arkansas	400,000	Yes	\$1,000,000.00	\$10,000,000.00	2007	Land Acquisition Program Admin.
AZ	Flagstaff	65,000	No	\$10 m bond	\$10,000,000.00	2012	Forest Stewardship
CA	Marin Municipal Water District	188,000	Yes	\$6,200,000.00	\$6,200,000.00	2016	Stewardship, Restoration
CA	San Francisco	2,500,000	No	\$3,000,000.00	\$30,000,000.00	2005	Easements, Restoration
CO	Denver Water Fund	1,300,000	Yes	\$3,300,000.00	\$16,500,000.00	2010	Forest Stewardship
CO	Aurora Water	340,000	No	\$250,000.00	\$1,000,000.00	2011	Forest Stewardship
CO	Colorado Springs Utility	430,000	No	\$1,500,000.00	\$6,000,000.00	2013	Forest Stewardship
GA/SC	Savannah Clean Water Fund	475,000	Yes?	\$1,500,000.00		2017	Forest Land Acquisition, Easements
HI	Maui	160,000	No	\$700,000.00	\$18,700,000.00	1997	Invasive Species Control
MA	Dennis Water District	15,000	Yes	\$190,000.00	\$2,500,000.00	2006	Land Acquisition
MA	Mass Water Resources Authority	2,500,000	No	\$8,000,000.00	\$133,000,000.00	1985	Land Acquisition, Stewardship
ME	Sebago Clean Water Fund	200,000	No	\$160,000.00	\$490,728.00	2008	Land Acquisition
MN	Mississippi Headwaters	1,000,000	No	Private Sources	\$1,000,000.00	2015	Land Acquisition
NC	Upper Neuse	600,000	Yes	\$2,200,000.00	\$10,000,000.00	2011	Land Acquisition, Restoration of Protected Lands
NM	Santa Fe Utility	32,000	Yes	\$220,000.00	\$880,000.00	2013	Implement Municipal Water Plan
NM/CO	Rio Grande	650,000	No	\$1,000,000.00	\$3,600,000.00	2014	Stewardship
NY	NYC Water Supply	8,500,000	No		\$500,000,000.00	1997	Land Acquisition, Stewardship, Program Admin, Monitoring
OR	Ashland	21,000	No	\$175,000.00		2015	Forest Stewardship
OR	Portland	900,000	No	\$1,152,000.00	\$7,460,000.00	2007	Transfer of USFS Lands, Restoration
TX	San Antonio	1,300,000	Yes?	\$18,000,000.00	\$90,000,000.00	2000	Easements
TX	Austin	885,000	Yes	\$83,000,000.00		1982	Land Protection, Stewardship
UT	Salt Lake City Public Utilities	400,000	Yes	\$1,500,000.00	\$6,000,000.00	1988	Land Acquisition
WA	Bellingham	90,000	Yes	\$5,000,000.00	\$50,000,000.00	2001	Land Acquisition
WA	Seattle Public Utilities	1,400,000	No	\$2,000,000.00	\$33,000,000.00	2000	Habitat Restoration, Decommissioning Roads, Monitoring
Subtotal		24,851,000			\$937,830,728.00		
Funds In Development				Projected			
NC/SC	Catawba-Wataree Water Fund	2,000,000	TBD	\$5,000,000.00			Land Acquisition
PA/DE	Brandywine-Christina Water Fund	600,000	TBD	\$1,000,000.00			Restoration
OR	McKenzie Watershed Fund	200,000	TBD	\$1,000,000.00			Land Acquisition, Stewardship
State Water Funds							
FL	FL Springs Restoration Program		??				Land Acquisition
NC	Clean Water Management Trust Fund		No	\$25,000,000.00	varies		Land Acquisition
RI	Penny per 100 program		Yes	\$3,000,000.00	\$81,000,000.00		Land Acquisition

MAP OF US WATER FUNDS

Water Funds

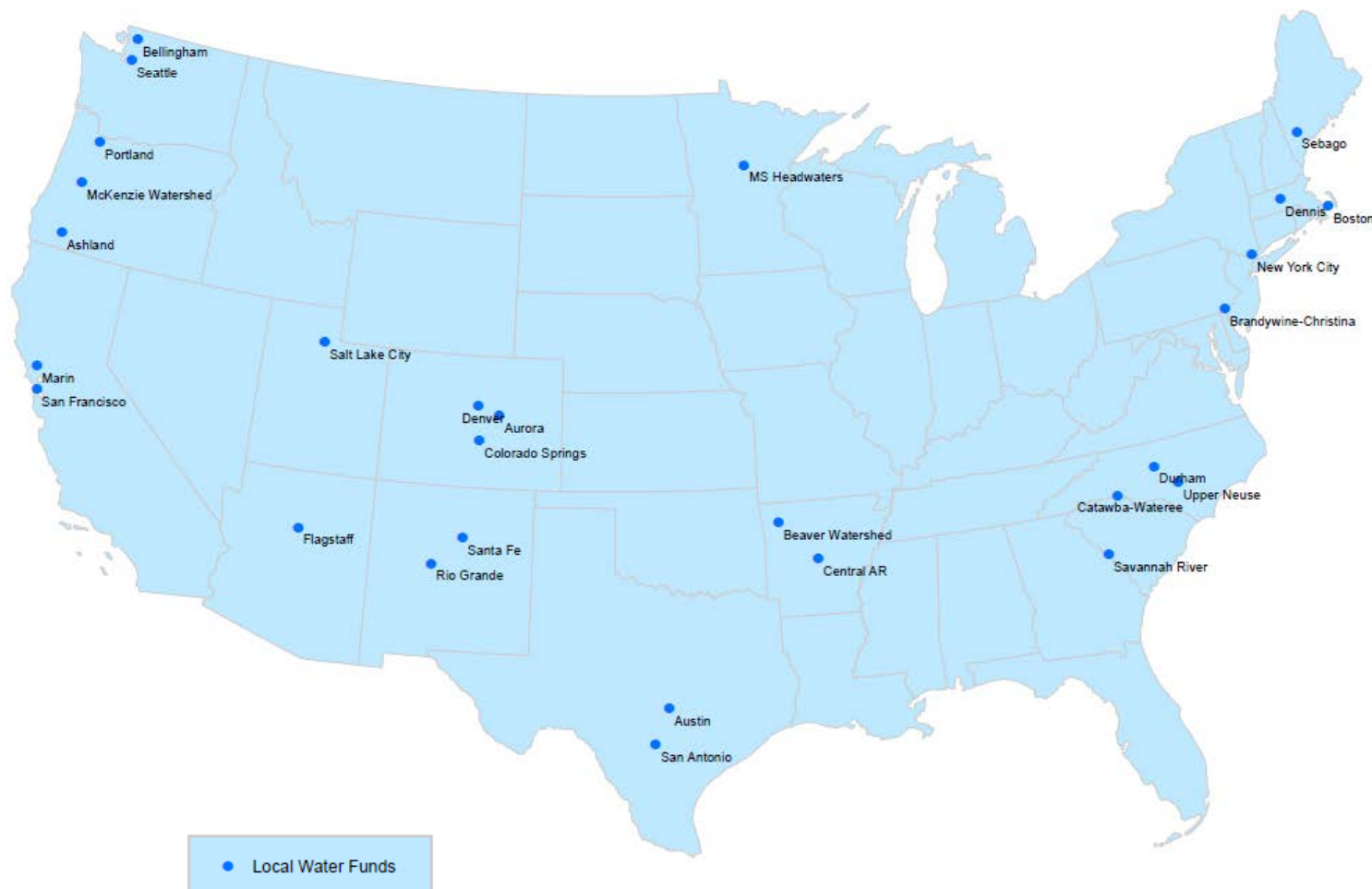


Figure 3.
Operational water funds
in the United States

Local water funds are a relatively recent phenomenon but number at least 25, with several more, including the Brandywine-Christina, in development (*Figure 3*). Most are informal: utilities simply choose to use a portion of their revenue for watershed protection. As many as 12, including the one in Raleigh, appear to have a dedicated separate fee for watershed protection. Funding is generally modest—about half collect less than \$2 million per year—but the amounts add up, can grow over time and have been used to protect thousands of acres and miles of streams.



CONCLUDING REMARKS

Water funds are conceptually compelling. They can provide a simple, straightforward solution to water quality challenges. When successful, they have the potential to create a long-term, locally supported funding source that can leverage additional funds from federal, state and local sources, as well as from philanthropy and private investors.

But establishing a water fund is complex and takes time. Given the range in models they employ, no one size fits all. And in many places, they are not even feasible. Still, the promise of creating a sustainable funding source for watershed protection is too good to pass up. Consider this quick calculation for inspiration. Given that the Delaware needs at least \$190 million in investment by 2024, if every one of the 15 million residents who depend on water from the Delaware River watershed paid \$1 a month, \$12 a year, water funds throughout the watershed could generate \$180 million per year. A clearly unrealistic scenario. But if the Brandywine Fund succeeded in leveraging just \$10 million, or 5 percent of that total, it would be a significant and inspiring victory.

RESOURCES AND REFERENCES

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The Nature Conservancy. Water fund toolbox.

<https://www.nature.org/ourinitiatives/habitats/riverslakes/water-funds-toolbox-welcome.xml>. This handy matrix describes the various phases of developing a water fund and its components. It includes a water fund atlas (for water funds involving The Nature Conservancy as a partner).

World Resources Institute. Watershed protection success factors.

<http://www.wri.org/publication/protecting-drinking-water-source>. This useful reference on source water protection programs considers water funds among several other finance options, and it describes the main factors for success.

OSI Delaware River Watershed Initiative Case Studies

To review Open Space Institute publications go to our website at www.openspaceinstitute.org/how/research and filter by "Land for Clean Water"

Case Study: Saving Lands for Clean Water in Sussex County, NJ (2016)

Case Study: Riparian Buffer Preservation Harris Farm (2017)

Case Study: Tapping the Carbon Market to Conserve Forests in the Poconos (2017)

Short videos on various approaches to conservation in the Delaware Watershed are also available on OSI's website research page: www.openspaceinstitute.org/how/research

With leadership support from the William Penn Foundation, the Open Space Institute administers the Delaware River Watershed Land Protection Fund, which provides capital grants for land acquisition and planning grants to promote watershed protection. Visit OSI's website to learn more: www.openspaceinstitute.org/funds/delaware-river-watershed-fund

Open Space Institute

The Open Space Institute (OSI) protects scenic, natural, and historic landscapes to provide public enjoyment, conserve habitat and working lands, and sustain communities. Founded in 1974 to protect significant landscapes in New York State, OSI has been a partner in the protection of over 2.2 million acres in North America.

Delaware River Watershed Protection Fund

With leadership support from the William Penn Foundation, the Open Space Institute administers the Delaware River Watershed Protection Fund, which provides capital grants for land acquisition and planning grants that advance scientific tools, planning, and public policies that help secure abundant, clean water.

Contact

Bill Rawlyk

Mid Atlantic Field Coordinator
brawlyk@osiny.org

Abigail Weinberg

Director of Research
aweinberg@osiny.org



**OPEN SPACE
INSTITUTE**

1350 Broadway, Suite 201
New York, NY 10018
info@osiny.org
www.openspaceinstitute.org