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Taking the Plunge

Guidance and Inspiration to Help Land Trusts Protect
and Restore Water Quality

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The Land Trust Alliance's mission is to save the places people need and love by strengthening land conservation across America.

Founded in 1982, the Land Trust Alliance is a national land conservation organization that represents more than 950 member land trusts and their 6.4 million supporters nationwide. As the national leader in policy, standards, education and training, we work passionately to support land trusts so they can save and secure more lands now and for future generations. The Alliance is based in Washington, D.C. and operates several regional offices.

More information is available at www.landtrustalliance.org.

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Taking the Plunge: Guidance and Inspiration to Help Land Trusts Protect and Restore Water Quality

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About This Guide

THIS GUIDE SERVES MULTIPLE PURPOSES

- ✓ It outlines the legal and policy framework around water quality so that land trusts can more easily navigate public policies to support their work.
- ✓ It directs land trusts to the processes, resources and technical assistance they need to make even more significant contributions to water quality.
- ✓ It guides land trusts through the process of incorporating water quality into their programs and land conservation activities.
- ✓ It aims to inspire land trusts to engage with this challenging, but rewarding, work by compiling stories of other land trusts that have successfully protected and restored water quality.

The guide focuses on two active geographies as models of where land protection and water quality are highly integrated pursuits: the Chesapeake Bay Watershed and the Great Lakes Basin. However, we expect that this guide will be useful to land trusts large and small throughout the United States. **The Land Trust Alliance welcomes ongoing dialogue about how to advance land conservation and water quality protection together.**

This guide is a product of the [Chesapeake Land and Water Initiative](#). The CLWI was created in 2016 and staffed by the Land Trust Alliance with support and partnership of the Chesapeake Bay Funders Network. The CLWI mission is “to deploy an integrated and innovative approach to permanent land protection, stewardship, community engagement, partnerships and public policy that will preserve and enhance water quality” across the Chesapeake Bay Watershed.

The CLWI enacts recommendations outlined in [a report commissioned in 2015](#) by the Chesapeake Bay Funders Network and conducted by the Land Trust Alliance and Long Haul Conservation Advisors. The report found that land trusts in the Chesapeake Bay Watershed are well-positioned to improve water quality by strategically protecting targeted properties as well as implementing and maintaining water-conscious management practices on preserved lands. Together, these land trust actions could have a major impact on water quality in the watershed, but additional resources, training and

technical assistance were required for land trusts to participate in water quality protection and restoration efforts more fully and intentionally.

The Alliance wishes to recognize and thank the many individuals who supported the research, drafting and development of this guide. Our core team of funders from the Chesapeake Bay Funders Network offered invaluable perspective throughout the process, and included Jamie Baxter (CBFN), Megan Gallagher (Agua Fund) and Sam Stokes (the MARPAT Foundation). Elizabeth Nellums wrote and researched this guide, with support from Alliance staff Mary Burke, Katie Chang, Artis Freye, Jennifer Miller Herzog, MaryKay O'Donnell and Andrew Szwak. A review team of leading professionals in the water and conservation fields advised on early versions of the guide, including Maggi Blomstrom (Piedmont Environmental Council, accredited), Kristen Saacke Blunk (Headwaters LLC), Steve Epting (United States Environmental Protection Agency), Mike Kelly (The Conservation Fund), Betsy Nicholas (Waterkeepers Chesapeake), Andrea Reese (Reese Conservation Consulting), Hallie Schwab (Open Space Institute, accredited) and Kate Wofford (Alliance for the Shenandoah Valley). The real stars of this guide are the land trusts and other conservation organizations whose staff spent time to share their stories. Thank you for lighting the many paths land trusts may follow to protect and restore water quality.

Introduction

Clean Water is Everyone's Concern.

In the early morning hours of Saturday, August 2, 2014, Toledo residents in the Maumee River watershed received a phone call that, due to [the buildup of toxic cyanobacteria from Lake Erie](#), their tap water was dangerous to drink, cook with or bathe in, even after boiling. For over three days, without warning, **half a million residents were unable to even touch their municipal water**. The National Guard was called in to deliver pallets of bottled water and packaged meals. It wouldn't be the last time—[another cyanobacteria bloom](#) occurred in the Maumee River estuary three years later.

[A toxic chemical spill](#) in January 2014 contaminated the Elk River in West Virginia, the source of drinking water for 300,000 residents around Charleston, West Virginia. It took more than two weeks for the chemical to be cleared.

In May of 2020, intense rainfall upstream of [Midland, Michigan](#) breached the beleaguered Edenville Dam; 50 homes were destroyed and more than 10,000 people were forced to evacuate as flood waters commingled with industrial containment ponds.

Fueled by climate change, the frequency of heavy precipitation and high-tide events has already increased across the United States and is projected to increase further, increasing the loads of sediment and pollution entering our waterways.

The EPA estimates that more than 770 cities across the nation have combined sewer systems, in which rainwater



“Most people think their drinking water is already protected. Just working with our jurisdictions, we’ve found that’s not true. They need our help.”

MATT GERHART, Northern Virginia Conservation Trust (accredited)



Stephen Petro of Fondy Food Center—a Making Allies Partner—working at a cooperative farm site. Photo courtesy of DJ Glisson II, Firefly Imageworks.

runoff, domestic sewage and industrial wastewater use the same pipes. As a result, heavy rainfall can release untreated sewage directly into lakes and streams. For instance, an Environmental Integrity Project report on Baltimore’s sewer system counted more than [400 separate incidents in 2015 alone](#). Fixing this problem is expensive. Cleveland is spending \$3 billion over 25 years to reduce untreated sewage overflow from 4.5 billion gallons down to 494 million gallons.

All these events have taken a toll. Across the country, unsafe fecal bacteria levels prevent residents from enjoying local beaches and streams. Depending on the bacteria levels and other contaminants in the overflow, residents are often forbidden to fish, swim or even splash around. Consequently, a 2021 Gallup poll showed that most Americans [worry](#) “a great deal” about pollution in their drinking water, rivers and lakes. Individuals across our country’s ideological spectrum consistently rank water quality degradation higher than other environmental concerns. Safeguarding our important, but fragile, relationship with water quality is therefore among the best ways to pursue common ground to protect the environment.

Land Trusts Play a Key Role in Protecting Water Quality.

There is an intimate connection between what happens on the land and the quality of the water that flows from it. It is widely accepted that protecting land benefits water quality; many of the earliest land preservation projects were developed around reservoirs, like the Catskills that protect the drinking water of New York City or the Yosemite Valley for California’s Bay Area. More recently, cities like Portland, Maine, Raleigh, North Carolina and Wilmington, Delaware, have invested significant public funding in the protection of

their watersheds upstream to ensure the safety, availability and cost-efficiency of drinking water for their residents.

This link between land and water protection means that land trusts—whose business it is to protect, restore and defend land—are perfectly positioned to lead water quality initiatives by example. Land trusts are already protecting wetlands that intercept and filter polluted precipitation, planting trees along riverbanks and encouraging farming practices that hold topsoil in place. They also bring a high degree of community trust, scientific and transactional expertise, long-term relationships with landowners and experience in outreach and education to water quality efforts.

With the potentially leading role that land trusts can play in protecting water quality, why do they not receive more support for doing so? In some cases, all that’s missing is for land trusts to describe what they do and how it benefits water using language that resonates with those protecting water. [A recent Alliance study](#) found that more than 97 percent of Midwest land trusts target streams and rivers for protection. The same percentage target wetlands and riparian corridors. **Even 59 percent target groundwater recharge areas.** Yet only 22 percent of these land trusts identified themselves as targeting drinking water. This presents an opportunity. Much, if not all, of the work listed above supports drinking water quality in ways that have measurable impacts that deserve to be recognized. It just needs the right description.

It makes sense that land conservationists sometimes struggle to speak the language of water quality, which has its own terms drawn from the fields of hydrology, geology, biochemistry and ecology. The U.S. Geological Survey’s [Primer on Water Quality](#) defines water quality as “a measure of the suitability of water for a particular

“We have to be mindful of what the local limitations are and how the tools in our toolbox can or cannot address them. We don’t want to overpromise.”

TANNER HAID, West Virginia Rivers Coalition



use based on selected physical, chemical and biological characteristics.” Due to the way U.S. environmental laws are written (which we will explore in the [Policy Section](#)), water practitioners focus on measurable changes to certain features of water: dissolved nitrogen levels, bacterial loads and percentages of certain chemicals of concern, for example. Meanwhile, many practitioners in the land trust community are experts on species habitat. Many others focus on the social benefits of open space and the associated intricacies of urban planning. Fewer have a solid background in pollution loading rates, [TMDLs](#) or flow path models.

To have tangible, demonstrable benefits on water quality, land trusts must understand the unique water challenges facing their communities and have science-based solutions to address them. To sit at the table with municipalities, wastewater treatment managers and drinking water experts and confidently say that your organization brings value to their water quality objectives requires you to speak their language. This guide seeks to

help land trusts learn about local water quality challenges, design ways to address them and communicate about the land-based solutions they can offer.

Even so, land trusts are already playing important roles in addressing water challenges like those described in Toledo, Charleston, Midland and Cleveland. And there is room for more. Land trusts can better communicate the impacts of their existing work. They can explicitly make reduction of water pollution a goal of their landowner outreach, land management and stewardship activities. They can also be more strategic and explicit in their project selection. The [Strategy Section](#) of this guide outlines a process that land trusts can use to help them position water quality more prominently in their work.

Engaging with Water Quality is a Powerful Way to Advance the Diverse Work of Land Trusts.

The land trusts featured in this guide engage in water quality work across many different projects with broad benefits. They are protecting and restoring lands that are important for species (aquatic and terrestrial), embody important community values (such as recreation and historic significance) and have demonstrated benefits to water quality. They expressed concern about climate change and building resilience in the communities they love, both human and ecological, through their work. They are also concerned about controlling growth and preventing development that could further strain limited natural and community resources. No matter the unique or specific focus of these land trusts, they all found success pursuing their diverse missions through water quality work.

Even beyond the normal measures of conservation success, land trusts are finding water work to be critically important to their growth and longevity. Land trusts report



What Is a Watershed?

A **watershed** is the land area that channels rainfall and snowmelt to creeks, streams and rivers and eventually to outflow points, such as lakes, bays, reservoirs and oceans. It is akin to a funnel in which all droplets of water flow to one common place.

Types of Water in a Watershed

Surface water is water that exists above ground. Lakes and streams are examples of surface water, as is snow. The oceans are typically considered surface water, too.

If water soaks into the soil, it is called **ground water**. In some places water may stay stored in underground **aquifers** for thousands of years, or it may quickly return to surface water.

Source water provides drinking water and can be either surface water (as in a reservoir) or groundwater (as found in a private well).

Wastewater is water that has been used in human applications, such as industrial wastewater coming from a factory or human sewage.

Stormwater starts as precipitation but carries pollution from developed areas, such as streets, rooftops and parking lots into nearby waterways.

Water exists in an interconnected cycle and today's wastewater may be treated to become tomorrow's source water.

reaching new constituents within their communities as they engage on water quality. They are recognizing that their efforts directly support disadvantaged and under-represented communities because **access to clean water is an equity issue**. They are also able to access new funding sources when they specifically describe how

their land conservation work addresses local and regional water challenges. They are able to accelerate the pace of achieving their goals and, in some cases, expand their missions. The [Case Studies Section](#) explores some of their stories in greater detail.

Water Quality Work Pays for Itself.

If the prospect of taking on water quality work seems intimidating, that's okay. Land trusts are just some of the many actors that must engage in water quality protection and restoration in order to protect our waterways and drinking sources. By comparison to most conservation projects, the financial commitments necessary to support this work seem astronomical. For instance, the 2017 agreement to repair Baltimore's sewage overflows (a modification of the original 2002 consent decree) was [projected by the Maryland Department of the Environment](#) to cost \$2.5 billion. In the Great Lakes, the cost to maintain, upgrade and replace drinking water infrastructure was [estimated by the Great Lakes Commission at more than \\$100 billion](#). These costs are paid, at least in part, through public dollars and rate hikes—the Environmental Integrity Project's [2015 analysis](#) showed that water and sewer costs for an average household had tripled in the time since the original consent decree was established in 2002.

The good news is that effective land conservation can help prevent even more costly investments. If land trusts can convey demonstrable cost savings to the public coffers, they can make a stronger case for more robust public support, funding and legal protections for conservation. What does your region expect to spend on drinking water, wastewater or regulatory enforcement in the next ten years? Could your organization make a measurable, quantitative impact with even a fragment of those funds? Could you help make the costs and benefits more equitable for your communities? These are some of the questions that land trusts can consider as they explore deeper engagement on water quality work. Please use this guide to help begin or continue that exploration.

Understanding the Policy Landscape of Water Quality

LEGAL FRAMEWORK

There is a complex network of laws, regulations and public policies that govern water quality and funding in the United States at national, state and local levels. Land trusts may be familiar with some of these policies due to their frequent overlap with conservation priorities. However, there are core elements and definitions in these policies that are important to know.

CLEAN WATER ACT

The Environmental Protection Agency's [Watershed Academy](#) provides an introduction to the Clean Water Act, “the cornerstone of surface water quality protection in the United States.” At the federal level, the Clean Water Act establishes the basic structure for regulating pollutant discharges into waters of the United States and regulates quality standards for surface waters. While many conservation laws have an impact on water quality—from the protections of the Endangered Species Act to the Wild & Scenic Rivers Act—the Clean Water Act is the largest, applying to rivers, lakes, wetlands and estuaries. Specifically, it

What’s the Deal with WOTUS?

The Clean Water Act defines “waters of the United States” (WOTUS) as “navigable waterways.” Water quality standards, total maximum daily loads, and many other federal clean water requirements apply only to WOTUS. Consequently, the WOTUS definition is critically important in how clean water protection is implemented.

There remains longstanding uncertainty about what does and does not constitute WOTUS. The Clean Water Act leaves open the precise definition of “navigable waterways” and defers interpretation to the EPA. In the decades since the Act was enacted, different administrations have repeatedly rewritten the administrative rules that define WOTUS.

In 2022, the Biden Administration announced that it would revert to the 2014 WOTUS definition and initiate a series of regional roundtable discussions to gather input on the WOTUS definition before taking additional steps to better define WOTUS. Future congressional and Supreme Court actions may additionally influence the WOTUS definition. For up-to-date information, see the EPA Waters of the United States [webpage](#).

“We were interested in conservation. Our partners came to it from the bottom line to not raise rates on users.”

ALAN ROWSOME, Northern Virginia Conservation Trust (accredited)

Key Terminology in Federal Clean Water Policy

Learning the language of federal water programs is an important first step to finding points of engagement for land trusts. Unfortunately, water quality terminology often references little-known policies and can be very technical in nature. This relative complexity sometimes creates a knowledge barrier between land trusts and the water professionals who use these terms. Below is a list of key terms used in reference to federal water quality programs.

Combined Stormwater Systems convey stormwater into sanitary sewer networks and their associated treatment plants. They are more common in older communities.

Combined Sewer Overflows (CSOs) occur when household sewage and stormwater loads combine to overwhelm available capacity and spill untreated into surface waters. (The federal government regulates CSOs and will occasionally penalize municipalities that experience an overflow, so local governments often try to prevent them by deploying low-cost mechanism to capture and filter stormwater—such as green infrastructure—and educating their communities about rain smart behaviors.)

Hydrologic Code Units (HUCs) are used to identify and classify watersheds in the United States. The country is divided into 21 different ‘HUC-2’ watersheds, such as the Chesapeake Bay and Great Lakes. HUC-2 watersheds can be divided into up to six progressively smaller watershed levels, which are each indicated with an additional two-digit code. For example, the Mid Atlantic HUC-2 watershed (02) is divided into HUC-4 subwatersheds like the Delaware River (0204), HUC-6s like the Upper Delaware (020401), and so on to HUC-12s.

Municipal Separate Storm Sewer Systems (MS4s) convey stormwater directly to local water bodies and are not connected to sanitary sewer systems or water treatment plants. They must be permitted.

Nonpoint Source Discharge Elimination System (NPDES) permits authorize local governments and certain industries to discharge point source pollution from things like factories, large-scale animal feeding operations or wastewater treatment plants.

Stormwater starts as rain or snow but carries pollution from streets, rooftops and parking lots into local lakes and streams. It is a major source of nonpoint source water pollution (discussed above) that can be difficult to control under the existing legal framework of federal laws and regulations. To fill this void, some local governments have established stormwater utilities to better manage it, and land trusts can play important roles in supporting these utilities.

Total Maximum Daily Load (TMDL) is the maximum amount of pollution that a waterway can support without exceeding its designated use. It can also refer to the scientific calculation that determines these amounts.

lays out protections for healthy watersheds and requires restoration of waters that are impaired. It also authorizes the EPA to implement programs that control water pollution, provide funding for water quality projects and enforce the law.

An important amendment called **Section 319** was added to the Clean Water Act in 1987. It authorizes EPA to better manage and regulate **nonpoint source** water pollution, which is broadly defined as pollution from many diffuse sources. For instance, stormwater runoff—one form of nonpoint source pollution—from developed areas, industrial facilities and certain construction sites is regulated by Section 319. Section 319 established a **national nonpoint source program** and authorizes states, Indigenous and tribal groups, and territories to obtain funding (often called “319 grants”) to implement EPA-approved nonpoint source management programs. Some land trusts have accessed federal resources for conservation in the form of 319 grants by working closely with their states’ water financing

agencies. For more information about how to access Section 319 and other EPA water quality programs, consult the EPA guide, [Advancing Watershed Protection Through Land Conservation](#).

SAFE DRINKING WATER ACT

The Clean Water Act is not the only significant federal legislation that impacts water quality. Congress also passed the Safe Drinking Water Act in 1974 to protect the public’s drinking water supply. This act sets national standards for tap water and provides grants to the states to help them meet these standards. A 1996 amendment specifically addresses **source water protection**, which encompasses “actions and activities aimed at safeguarding, maintaining or improving the quality and/or quantity of sources of drinking water.” This amendment is especially notable for land trusts because it includes guides for protecting sources, such as groundwater, rivers and reservoirs.



The Safe Drinking Water Act now requires states to have [Source Water Assessment Programs](#). These programs must “identify the land area(s) which provide water to each public drinking water source in their state; complete an inventory of existing and potential sources of contamination in those areas; determine the susceptibility of each drinking water system to contamination; and distribute the results of the assessment to water users and other interested entities.” States’ Source Water Assessment Programs can be valuable partners and sources of important information for land trusts. The aggregated [results of Source Water Assessment Program findings](#) are available by location.

OTHER FEDERAL LEGISLATION

Many other federal programs and policies have significant impacts on water quality protection and restoration as well. The Agriculture Improvement Act, more commonly known as the **Farm Bill**, is the single largest federal source of funding for conservation on private lands. Through this funding the U.S. Department of Agriculture delivers more than 20 programs and subprograms through the Natural Resources Conservation Service (NRCS) and the Farm Service Agency.

Some Farm Bill programs are explicitly focused on water quality, such as the Watershed Rehabilitation Program and the Grassroots Source Water Protection Program. Many other programs benefit water quality, even if “water” is not in the program title. For instance, the 2018 Farm Bill requires that 10 percent of funding through NRCS go toward [protecting source water](#)—approximately \$400 million per year. Land trusts are familiar with some of these Farm Bill programs, such as the Agricultural Conservation Easement Program (ACEP) and Conservation Reserve Enhancement Program (CREP), which can be used to protect both land and the water flowing from that land. Individual funding programs are described in more detail in the Resources section of this guide and up-to-date information on the latest Farm Bill programs can be found on the [Land Trust Alliance’s Farm Bill webpage](#).

The Coastal Zone Management Act of 1972 (CZMA) provides for essential coastal (including the Great Lakes) and estuary management through the National Oceanic and Atmospheric Administration (NOAA). It authorizes three national programs: the National Coastal Zone Management Program, the National Estuarine Research Reserve System

and the Coastal and Estuarine Land Conservation Program (CELCP).

The National Flood Insurance Act of 1968 gives authority to the Federal Emergency Management Agency (FEMA), to reduce flood damage by restricting development in designated floodplains.

The U.S. Fish and Wildlife Service (FWS) and the NOAA National Marine Fisheries Service administer the Endangered Species Act of 1973 (ESA). Among many other conservation objectives, the ESA has provided wetland protections for endangered aquatic species that rely on high-quality water habitats, such as endangered amphibians, fish and waterfowl.



FEDERAL CLEAN WATER POLICY AT THE STATE AND LOCAL LEVELS

Federal policies set the legal, funding and programmatic framework for water quality. However, the resources and programs that implement these policies are mostly at the state and local levels. Land trusts typically find that state and local water quality programs, which may be utilizing federal resources, are much more accessible. Understanding how federal policies flow down through state and local governments can help land trusts find the right resources for water-focused conservation efforts.

Using EPA guidance, individual states, territories and Native nations are required to establish **water quality standards** for their surface and drinking waters. These standards are set according to goals and pollution limits that correspond to **designated uses** of each waterbody. For instance, a waterway with a designated use of navigation will have an allowable limit of certain pollutants that is different than for a waterway designated for public water supply. Designated uses are established through a combination of federal and state laws and processes, some of which are currently being debated and amended.

Waterways that do not meet their designated uses are considered impaired. All states are required to list their impaired water bodies and their plans for cleaning them up. Since this requirement comes from section 303(d) of the Clean Water Act, the list of impaired waters for each state is also often called “the 303(d) list.” Waters may be

listed for many reasons, including amounts of specific water pollutants, sediment, bacteria, heat, dissolved oxygen, or even [trash](#) and [invasive species](#). Criteria that measure these elements of water quality can be expressed narratively or numerically to describe chemical, biological or physical conditions required to support a water body’s designated uses. For instance, water quality measures can be as diverse as flow volume in streams (sufficient to support designated uses) to trash concentrations and temperature. You can learn more about the water quality in your local waterways on EPA’s [How’s My Waterway](#) website, which helps you find out what waterways are listed as impaired and the causes of the impairment.

State Planning to Address Water Quality

In most cases, once a body of water is listed as impaired, the state must develop a plan to address the pollution. These plans may be produced by the state or by EPA itself in rare cases. Plans typically take the form of what might be called “a pollution diet.” For example, a plan might say that to meet required water quality standards to support shellfish, a certain river can’t handle more than so many tons of sediment, so many pounds of nitrogen and so many pounds of phosphorus in a day. This limit is called the **total maximum daily load**, or TMDL. While technically a TMDL is the cap placed on pollution, it is often used to refer to the plan itself.

A TMDL plan contains multiple pollution calculations—a waste load allocation for pollution from point sources, a nonpoint load allocation and a margin of safety. Plans to reduce the nonpoint allocation often take the form of education and voluntary conservation measures, such as implementing **best management practices** (BMPs) on farms to reduce runoff, planting trees and protecting riverside buffers. EPA recommends that TMDLs also account for future growth within the watershed.

Public participation is a required part of the planning process, and so nonprofits and community groups may play a significant role in plan development. Many land trusts find it to be beneficial to engage in the process of writing plans for impaired watersheds because a well-written plan may include the preservation of sensitive lands and outline restoration opportunities. Still, preservation alone is usually not the major focus of a TMDL plan, since the goal is to reduce the current pollutants entering the stream.

Individual states have the leeway to create their own programs to implement other elements of the Clean Water Act. For instance, some states and many local governments develop comprehensive water plans that incorporate water quality, drinking water and other water-related considerations into one document that guides related planning and policymaking. Land trusts may find opportunities to engage in state or local-level water planning processes.

State Resources to Address Water Quality

State water funding programs are highly variable, but many function as pass-through programs for federal resources. These pass-through funding programs are increasingly focused on TMDL implementation. For example, the 319 funds that are administered by states to conduct nonpoint source control projects typically focus on 303(d)-listed, impaired water bodies. These 319 grants often provide pass-through funding to entities for local implementation projects and can also fund TMDL study development. The EPA's [nonpoint source program grant guidelines](#) allow some flexibility in using watershed project funding to protect unimpaired waters, usually when a state's program has identified specific unimpaired waters as a priority.

Additionally, there are state financing programs to help improve in-stream water quality, drinking water and wastewater. An amendment to the Clean Water Act in 1987 created the **State Revolving Funds** (SRF) to provide low-interest loans for projects that make water quality improvements. To date, most SRF resources have gone to traditional grey infrastructure, such as wastewater treatment plants and drinking water treatment facilities. However, they can finance other types of water quality projects as well. For instance, the [Clean Water State Revolving Fund](#) specifies that land preservation that benefits water quality is eligible for financing and that public, private and non-profit entities are eligible.





SRF loans are becoming increasingly accessible to land trusts as tools to protect land. While generally SRF loans must be repaid with interest, certain states have different mechanisms to reduce the repayment burden on their borrowers. Some states employ a provision called “[sponsorship lending](#),” which removes the repayment obligation for a small part of a much larger financed project. Waived costs commonly include those associated with nonpoint source projects, such as stream restoration or land protection. Some states also use negative interest loans and principal forgiveness to reduce the overall financing costs for certain borrowers, including disadvantaged communities and sponsors of “green” projects.

The 2021 Infrastructure Investment and Jobs Act more than doubled the Clean Water State Revolving Fund. This provides an excellent opportunity for land trusts to work with their states to use it for more land protection, restoration and other green infrastructure projects. Each state has [program contacts](#) for their Clean Water SRFs. In addition to responding to potential project inquiries, state program contacts are required to issue public reports on the use of their SRF funding, which can serve as another source of background information about how land protection projects that benefit water quality could be financed.

State agriculture programs can also be utilized to improve on-site water quality. State-level NRCS [programs](#) can choose to emphasize certain Farm Bill programs and priorities, including those with an explicit focus on water quality. State Cooperative Extension offices and locally based [Technical Service Providers](#) are also great resources that can offer more site-specific guidance on potential water quality improvements. Land trusts are natural partners in the outreach and delivery of these services.

Some federal programs do not allow land trusts to receive direct support, but instead provide opportunities to form working partnerships with state governments that benefit water quality.

The 2021 Infrastructure Investment and Jobs Act more than doubled the Clean Water State Revolving Fund.

Partnership Opportunities

- In some states, water infrastructure loans are only open to local governments, but nongovernment partners are often encouraged to participate in financed projects.
- The Clean Water Act also authorizes [Section 106 grants](#), which fund states to conduct water quality assessments and protect source water resources.
- Through [Wetland Program Development Grants](#), land trusts can partner with state governments to establish programs that monitor, protect, restore, regulate and benefit wetlands.
- There is increasing need to address water quality impacts of flooding and other natural disasters. The Federal Emergency Management Agency awards multiple types of grants through its [Hazard Mitigation Assistance](#) program. Project costs that can be covered through these programs include restoration of wetlands, streams and floodplains, installation and land acquisition for green infrastructure and land protection directly related to disaster prevention.

Regional Water Initiatives

Although most federal water policy is implemented at the state level, regional initiatives that correspond to major watersheds are becoming more common and influential.

In 2010, EPA established a [TMDL for the entire Chesapeake Bay Watershed](#). The TMDL covers the entire 64,000 square miles within the watershed, including parts of six states and the District of Columbia. This plan is administered through the [Chesapeake Bay Program](#) and outlines measurable, time-limited goals for water quality improvement—particularly regarding nitrogen, phosphorus and sediment levels—in order to achieve specific water quality standards by 2025. It is the largest TMDL ever developed and combines 92 smaller TMDLs that cover different tidal segments of the Bay.

Progress toward the TMDL goals is measured through the Chesapeake Bay Model—a complex calculation of pollution loads coming from over 2,000 individual segments of land and water within the watershed. Acceptable pollution loads are then allocated between individual jurisdictions and river basins using a combination of resource modeling and monitoring data. Land protection—especially of wetlands and forests—plays a prominent role within the Bay Model as ways to help meet the modeled pollution load goals.



Chesapeake Bay Watershed boundary. Photo courtesy of P. Haggerty, USGS.

In the Great Lakes Basin, the [Great Lakes Restoration Initiative](#) is a multi-agency collaboration with a [five-year action plan](#) that funds water quality projects by Native nations, local governments, universities and nonprofits. Focus areas for ongoing action (and financial support through the Initiative) include toxic substances in areas of concern, nonpoint source pollution on nearshore areas and invasive species. The plan is non-regulatory and is not a regional TMDL but was codified under the 2015 and 2016 amendments to the Clean Water Act and receives direct congressional appropriations. Land protection and restoration are commonly funded projects by the Initiative. Other regional water-based initiatives include those in the [Puget Sound](#), [Gulf Coast](#), [Prairie Pothole](#) region and more.

Beyond funding opportunities, regional coalitions commonly foster partnerships that are beneficial to many land trusts. In the Chesapeake Watershed, the [Choose Clean Water Coalition](#) is an alliance that advocates for clean water at both the state and federal levels. Coalition members participate in setting agendas and priorities for action on clean water at the regional level. In the Great Lakes, the [Healing our Waters Coalition](#) plays a similar role in advocating for policies that improve clean water and the ability of local and regional organizations and governments to access federal resources to do so. Likewise, the [Coalition for the Delaware River Watershed](#) plays a similar role in that landscape. [Source Water Collaborative](#) hosts a [national map](#) of regional initiatives.

Strategic Conservation Planning for Water Quality

The Five-Step Strategic Process

1. Identify local water quality challenges and opportunities
 2. Determine your organization's existing impacts
 3. Identify “easy wins” to increase these impacts
 4. Develop a programmatic framework
 5. Evaluate and choose between potential projects
-

If your land trust is ready to start engaging more deliberately with water quality work—where do you start? The answer will not be the same for every land trust. There are key considerations that land trusts should have in mind as they determine what actions will be the most strategic, efficient and effective for them. There is also a growing suite of geospatial and informational tools to support whatever actions your land trust chooses. This section outlines a five-step process for identifying these key considerations and tools. It then presents an organizational framework you can use to build a water quality program that delivers water quality results.

1 Identify Your Community's Water Quality Challenges and Opportunities.

The first step is to get specific about the water quality challenges that are most important in your community. Here are some questions you may consider.

- What are your community's baseline conditions? Where does your drinking water originate—stream-fed reservoirs, surface streams, groundwater, upstream areas?
- Are your local streams impaired? By what contaminants—nitrogen, phosphorous, sediments, heavy metals? What are their sources?
- What other conditions are exacerbating water pollution—buildings in floodplains, leaking septic tanks, cows in creeks, streambank erosion, combined sewer overflows?
- Is your community sending degraded water downstream? Where is it going?
- Do communities in your service area identify water quality or drinking water supply concerns in their comprehensive planning documents?

“Shifting our land trust and our collaborative toward water came naturally. Still, perhaps there are more cross-pollination opportunities among Bay advocates and land trust advocates.”

DAVID LILLARD, Catoctin Land Trust

“For water quality, the problems are varied—it’s different triggers in terms of how the municipalities are getting interested.”

STEPHANIE ARMPRIESTER, Brandywine Conservancy (accredited)

As you begin to understand the water quality challenges in your community, your land trust may recognize opportunities to work with local partners to address them. For instance, many communities look to water engineers for help on water issues, but conservation organizations and land trusts have growing roles in the delivery of nature-based solutions to flooding, aquifer recharge, water quality protection and more. Nature-based solutions are conservation actions that address localized water quality challenges that exist in your service area. Effective conservation actions and best management practices (BMPs) for water quality are tailored to address specific impairments in specific geographies. So, it takes some research to determine the right actions for your community. Your land trust can identify conservation actions that traditional water engineers may overlook.

Your land trust does not need to unilaterally determine what conservation actions may be right for your community. Soliciting input from outside experts and resources will lend additional weight to conservation actions your organization recommends. Universities, water research centers and state agencies or Soil and Water Conservation Districts are often good places to start. The National Sources of Geospatial Water Quality Information callout box on page 24 lists some widely available information sources. In most areas, land trusts also have access to a robust suite of state and local data that can help identify opportunities to implement nature-based solutions to local water quality challenges. However, land trusts often need to develop partnerships to transform such information into intuitive and manageable formats.

2 Determine Your Organization’s Existing Impact.

Once your organization has identified conservation actions that will address your community’s water quality challenges, you can begin to decipher what opportunities you have to complete these actions. With this goal in mind, you can begin by taking stock of what you are currently doing to advance clean water outcomes. **Most land trusts will find that they are already engaging in work that benefits water quality** and safeguarding these benefits in perpetuity. For instance, if you preserve wetlands, restore and protect agricultural buffers or plant trees, you are reducing the amount of contaminants being flushed into surface waters. By protecting land with conservation easements, your land trust is preventing land from being paved with impervious surfaces. This action [conveys significant water quality benefits](#) in the form of flood prevention and runoff reduction.



Patuxent River, Maryland. Photo credit: Mary Burke

Chesapeake Bay and Delaware River Watersheds

In the **Chesapeake Bay Watershed**, an initiative under the Chesapeake Bay Program's Maintain Healthy Watersheds Goal Implementation Team is focused on explicitly crediting the water quality contributions of land protection in the [Chesapeake Bay Model](#) and the Chesapeake Assessment Scenario [Tool](#). The basic methodology for this “crediting conservation” process is multi-step. First, future growth and associated land use changes are estimated using a scientifically defensible 2025 land use projection called the Chesapeake Bay Land Change Model. Then, future nutrient and sediment loads for different subwatersheds are estimated based on anticipated growth and land use changes associated with current zoning patterns. Next, alternative water quality scenarios are modeled when different levels of land preservation activity are undertaken, thereby preventing a certain degree of water pollution. Land

protection is then credited as a best management practice, with specific nitrogen, phosphorus and sediment values associated with it, based on the modeling results.

In the **Delaware River Watershed**, the William Penn Foundation funded a [Land Protection Impact Assessment](#) to quantify the impact of lands preserved through their Delaware River Watershed Initiative. One model describes how far downstream water quality benefits extend from protected lands, while another quantifies the pollutant load that riparian buffers filter from their surrounding landscape. The foundation estimated that in order to provide clean water throughout the basin, 350,000 acres of streamside and headwater land must be protected, with a projected cost of \$1.75 billion.

Quantifying the water quality benefits of your work can help you both advertise your organization's existing impact and benchmark progress over time. For land protection projects, it is possible to quantify the impact of avoided development in terms of either the gallons of stormwater or the volume of various pollutants that would be added to the ecosystem under various development scenarios. There are multiple ways to complete this quantification. Depending on the watershed in which you are working, your options may vary, as illustrated by the Chesapeake Bay Watershed and Delaware River Watershed examples.

When restoration and stewardship are layered on top of land protection, additional benefits are often quantifiable and may be more widely accepted by regulators.

For instance, the Stroud Water Center, through the WikiWatershed Initiative, hosts [Model My Watershed](#), which provides both data visualization and compares impacts of different conservation and development scenarios on water quality. It is also possible to quantify some impacts of restoration projects by conservation practice. For example, the Center for Watershed Protection has created a [model](#) that specifically quantifies nutrient impacts of urban street trees. To quantify the impact of common best management practices such as buffers, on-farm practices and green infrastructure projects, the National Fish and Wildlife Foundation has developed an online tool for the Chesapeake Bay called [FieldDoc](#), based on the Chesapeake Bay model's [Assessment Scenario Tool](#).

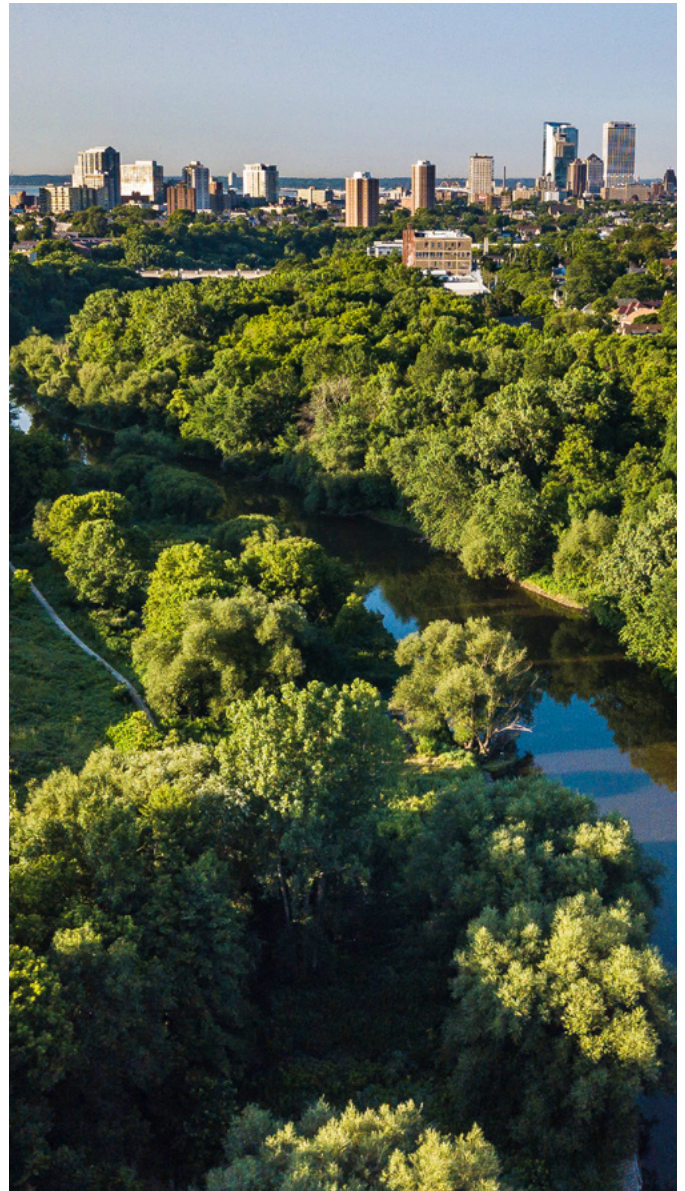
“It’s difficult to get a measurable difference in water quality if you’re just preventing a future problem.”

DEBORAH NETT, Northeast Wisconsin Land Trust (accredited)

3 Identify “Easy Win” Opportunities to Immediately Increase Water Quality Impacts

Using these tools and geospatial resources may show that your land trust is already making a significant contribution to local water quality. But don’t stop at simply quantifying your organization’s current impact. After you’ve given yourself a pat on the back for all that you have done, consider auditing your current properties to identify new best management practices that would make additional improvements to water quality. Parcels that are already preserved for agricultural production, open space or community access could support additional improvements that immediately boost water quality outcomes. Some questions to consider as you explore new water quality improvement opportunities on your existing properties include:

- Do the properties your land trust owns have forested buffers on streams? Are they wide enough?
- Are there any problem spots on your properties—crumbling stream banks, eroding topsoil, illegal dump sites—that could be addressed?
- If you lease your land to farmers, do they practice no-till agriculture, cover cropping or contour strip farming? Have you offered to connect them with [Technical Service Providers](#) who could help plan, design and implement conservation plans?
- Are owners of your easement properties aware of the federal and state programs that can be tapped to cover costs of installing water-focused best management practices? Do you systematically inform or remind your easement landowners of these programs?
- Could impervious surfaces—parking lots, sidewalks, driveways—be made permeable?
- On buildings you own or lease, can you redirect gutters into rain barrels and install a rain garden to capture any overflow?



Milwaukee River in Milwaukee, Wisconsin. Photo courtesy of DJ Glisson II, Firefly Imageworks.

“Laws mandating the reduction of pollutants and sedimentation can be changed. Riparian buffers protected by easements are forever.”

SAM STOKES, MARPAT Foundation

“For due diligence, we check a suite of water resource related factors. We now know much better what will affect our partners’ interests.”

MATT GERHART, Northern Virginia Conservation Trust (accredited)

4 Include Water Quality in Your Mission and Programs.

Considering your community’s water quality challenges and your land trust’s current and potential impact on water quality, how will your organization prioritize water quality protection going forward? Start by putting it in writing—for example, write water quality explicitly into your mission and vision statements, add water questions to your project selection criteria, or develop a public statement on how water quality advances your organization’s purpose. Doing so provides a framework for addressing subsequent questions that may arise. Here are some questions to consider as you think through what it means for your land trust to work on water quality:

- Will adding water quality programming into your organization’s mission resonate with your supporters and motivate them to further engage with your land trust?
- What kinds of water quality work would best embody your land trust’s mission and attract support from outside partners?
- Will you consider water quality impacts when deciding how to dedicate resources to one project or another?
- Will you pursue projects solely for their water quality benefits?
- How will you manage conflicts between providing water quality protection and producing other co-benefits, such as farmland preservation, recreation or public access?
- What high level, strategic outcomes do you want to accomplish through your water-related programming? For example, do you want to help your local waterway meet the goals outlined in its TMDL plan?

In the process of outlining your land trust’s future water quality ambitions, there are many perspectives outside your



organization to consider as well. Knowing the communities you serve and where your land trust fits within the ecosystem of other stakeholders working on water quality issues is critical to your land trust’s success. Getting a complete picture about the communities where you work is an important next step.

It is just as important to understand who else is already working on local water quality issues. Water quality is typically a partnership-intensive practice and so it is important to position your organization’s water quality programming in a way that will complement others’ efforts. Conserving natural areas and wildlife habitat tends to be the “bread and butter” work for many land trusts and so their partners and community members often know them as groups that specialize in nature-related projects. Consider how your organization’s capacities and expertise, whatever they may be, can fill a niche or otherwise support the collective water quality

efforts in your area. Here are some questions to consider as you formalize your land trust's role within your community.

- How knowledgeable is your community about local water quality issues and the role that conservation plays in improving it?
- Do educational opportunities exist for your organization to build the local knowledge base, either directly or with partners?
- How will you advertise and communicate about your water quality work?
- Water quality is an important issue to everyone—are you being inclusive with your outreach and communications about the work you are doing?
- Are you considering the full range of opinions and audiences for your work that exist in your community?
- Are there existing conservation collaboratives, watershed councils or other partnerships that can help embed your land trust into the broader suite of ongoing water quality work?
- Are there opportunities to bring underrepresented partners and perspectives into your work?

It is important to note that land trusts often have a considerable advantage when seeking funding or project support for making water quality improvements. Funders often recognize that implementing water quality best management practices on permanently protected land trust properties is an investment for the long term. From a maintenance cost standpoint, because land trusts are already in the business of long-term stewardship, they are well positioned to address questions about how funded water quality improvements will be maintained.

5 Evaluating and Choosing Between Potential Water Quality Projects.

After thinking through challenges, opportunities, priorities and potential partners, land trusts can focus on more practical considerations of what water quality projects they will undertake. A good first step is to include water quality criteria when considering new land acquisitions or easements. Many land trusts interviewed for this guide began successfully advancing water quality goals by creating prioritization models that incorporate water quality considerations. This guide does not prescribe any one decision-making framework for evaluating or choosing between potential projects, nor does it recommend specific criteria that land trusts should use. However, this guide recommends some general questions for land trusts to consider as they begin this process. For additional guidance on project selection criteria, see [Practice Elements 8B1 and 8B2](#) of *Land Trust Standards and Practices*:

Land Trust Standards and Practices Practice 8B

Project Selection Criteria and Public Benefit

1. Develop and implement a written process to select land and conservation easement projects.
2. Develop and apply written project-selection criteria that are consistent with the land trust's conservation priorities.
3. Document the public benefit of every land and conservation easement project.



Restored Wetland Pool at Redhorse Bend Preserve. Photo courtesy of Black Swamp Conservancy.



Flag Ponds Nature Park, Maryland (Chesapeake Bay). Photo credit: Mary Burke

Embedding water quality into your organization's project evaluation process does not need to be laborious. During your project selection and evaluation process, some kinds of water quality projects will likely stand out as especially consistent and compatible (or inconsistent and incompatible) with your land trust's mission, strategic conservation plan, anticipated programming and existing or future capacities. Additionally, most of the land trusts interviewed for this report stated that they protect lands that convey multiple benefits—important for water quality while also protecting wetlands, wildlife habitat or scenic views. Therefore, most land trusts did not need to make major changes to their organizational priorities or project evaluation procedures in order to incorporate water quality into their work. For instance, Grand Traverse Regional Land Conservancy (accredited) set up a simple system to prioritize water quality in its priority regions by parcel, assigning points to wetlands, lake or river frontage and headwater areas. Similarly, Alliance for the Shenandoah Valley layered impaired waterways over other cultural resources, like battlefields, to enrich an already robust mosaic of conservation opportunities.

Another important question to ask at this juncture is how water quality projects under consideration will (or could) affect the operations and long-term stewardship obligations of your land trust. Some water quality

projects come with important considerations that could influence their “fit” within your land trust's water quality programming. Some of these considerations include:

- Water quality projects, such as green infrastructure sites, riparian buffers and some BMPs, are often impacted significantly by increasingly extreme precipitation events—how could this variability affect the permanence of conservation restrictions that your land trust uses? If needed, how would you amend your easement templates or deed restrictions to accommodate projects that may require more intensive management to protect the conservation values of the property? How will your management plans address the sudden or gradual obsolescence of certain BMPs in your projects and on your properties?
- Water quality projects often require significant, ongoing maintenance to remain effective. (This maintenance can be very different from the stewardship and restoration work done on natural areas.) How will your land trust secure the necessary resources and technical capacities to conduct this maintenance?
- Water quality work can involve many local, state and federal regulatory agencies in addition to a wide range of nongovernmental partners and other stakeholders. What new or expanded partnerships will your land trust take on in order to plan, conduct and maintain water quality-oriented work?

As these considerations demonstrate, restoration and stewardship comprise significant parts of many water quality projects. In fact, some land trusts' most impactful projects were properties preserved not so much for their existing conservation values, but with an eye toward significant restoration like wetlands recreation, large-scale reforestation and stream restoration. While protecting land conveys significant water quality benefits, land trusts can generate additional water quality gains through restoration and stewardship. It is important to know and consider the potential benefits of adding restoration and stewardship work to your project designs while balancing these benefits against their associated costs over the short- and long-term. Consider the following questions as you assess the merits of restoration and stewardship for different projects.

- Would your land trust consider protecting a property solely to benefit water quality or are other conservation values equally as (or more) important? If the former, is realizing the desired water quality benefit contingent upon restoring and subsequently stewarding the property?
- What sources of funding are (or could be) available to undertake a potentially complex restoration project? Will you have organizational capacity to absorb potentially uncompensated costs attributable to staff time? Are associated permitting, contracting and construction costs recoverable?
- Do you have partners to conduct potential earth-moving work and do they understand the multiple conservation values that need to be protected? For example, are they willing to work around wildlife's particular needs at different times? Could delays in permitting or contracting cause the project to intrude on other conservation values on the site? How can these effects be mitigated?
- If your intention is to restore or remediate a site, have you clearly communicated the benefits of your project to the original landowner, community stakeholders, project partners and neighbors so that they can understand, despite all the earth-moving they may see, that this project will be good for water quality? Can you implement a strategy to proactively communicate about short-term impacts, such as tree removals or temporary access restrictions that may influence how the public views your land trust and its conservation mission?
- If a project is undertaken as part of a regulatory water quality improvement program, like an impaired waters plan, have all stakeholders agreed on how the project will be credited and how it will be reported?

SPOTLIGHT

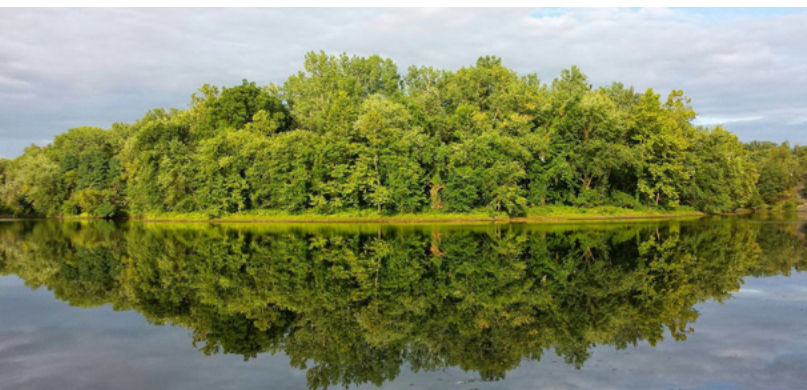
Communicating Conservation's Benefits to Water Quality in Pennsylvania

Despite the complexity of quantifying the water quality benefits of conservation, it is vital to communicate it effectively. This allows your work to resonate with new partners and stakeholders in your community.

While working to preserve a beloved local farm, Deborah Nardone of ClearWater Conservancy (accredited) discovered that residents did not realize that the farm sits atop the source water protection zone for State College, Pennsylvania. She went to the local water authority to help her assess the farm's importance to local drinking water. Due to the karst topography of the area, it takes rainwater less than five days to enter the groundwater and thus the town's drinking water supply. This knowledge allowed her to communicate the importance of protecting the farm as a means to protect local drinking water and thereby reach and gain support from new audiences in the process.

Finally, remember that you don't have to go it alone—and you shouldn't! When conducting interviews for this guide, partnership was an ongoing theme and a key indicator for the success of the projects. Land trusts that don't have significant expertise in-house can often find that expertise elsewhere through collaboration, sparing themselves a lot of expense and frustration. Particularly at a landscape scale, it may be possible to find additional support.

The Land Trust Alliance can also connect land trusts with helpful water quality partners. Its Great Lakes and Chesapeake Land and Water Initiatives have been “transformational” for many of their participants. They have helped land trusts “to form and launch a conservation collaborative,” “get the start-up resources we needed to build trust and work together,” “take immediate conservation action and successfully conserve around 800 acres” and “successfully acquire more funding for continued efforts.” For more information or assistance, email Alliance staff at midwest@lta.org or northeast@lta.org.





In addition to the resources already mentioned in this guide, land trusts frequently mentioned the following partners:

- *Data producers or GIS analysts with an understanding in water quality modeling:* Consider, for example, USGS Water Resources Mission Area [Science Centers](#), university partners and water research centers.
- *Technical experts in wetland delineation or stream geomorphology who can assist with restoration projects:* Consider university partners, environmental consulting firms, Trout Unlimited or Ducks Unlimited (accredited), local watershed councils.
- *State and local agencies* for drinking water, sewer and stormwater systems.
- Indigenous and tribal groups.

True community engagement means seeking out voices that are often overlooked, particularly low-income and urban core communities. The risk of flooding in the U.S. [disproportionately affects Black communities](#) and [more drinking water violations](#) occur in communities of color, low-income communities and areas with more non-native English speakers. Climate change is likely to exacerbate an already unjust and unequal system. Connect with “Friends” groups for parks and streams, neighborhood associations and civic groups in the places that are on the front lines of our current water challenges.

The next section of this guide offers ideas and inspiration for how land trusts have put water quality improvement into action. It includes more than a dozen examples of how land trusts have incorporated water quality, resilience to climate change, environmental justice, and source water protection into their strategic conservation activities. These case studies focus on two iconic watersheds characterized by strong regional identities, broad community support and effective local land trusts—the Chesapeake Bay and the Great Lakes.

Community Engagement Resources

- [Expanding the Circle: Strategies to Authentically Engage Under-Resourced Communities to Improve the Chesapeake Bay Watershed for All](#)
 - [Groundwork USA: Best Practices for Meaningful Community Engagement](#)
 - [The Chesapeake Bay Program: Top 5 Resources for Community Engagement From a DEIJ Perspective](#) (with examples from Seattle, Detroit and Levittown, NY)
-

“I don’t see how stormwater fees could stop going up; in the older urban core the infrastructure is aging and upstream infrastructure is driving the need. We’re not taxing the different areas equitably.”

ISAAC ROBB, Western Reserve Land Conservancy (accredited)

The Power of Mapping to Advance Water Quality Through Conservation

Geospatial information is an important tool for land trusts. It allows land trusts to see the geographical distribution of targeted natural features and use this information to guide their conservation work. Many land trusts already use Geographic Information Systems (GIS) for mapping parcels and projects. However, geospatial water quality information often comes in the forms of modeled outputs and complex geospatial analyses. These data require different skills to utilize than the type of map-making involved in creating baseline document reports or site plans. Parsing, analyzing and summarizing these complex data in accurate, useable ways requires technical capacities that many land trusts do not have.

Consequently, conveying geospatial assistance to land trusts is a key intervention to increase the water quality benefits of land conservation. With funding from the Chesapeake Land and Water Initiative, the Land Trust Alliance is addressing the need for geospatial tools and resources among land trusts by partnering with the [Conservation Innovation Center](#) at the [Chesapeake Conservancy](#). The Center uses cutting-edge technology to empower data-driven conservation and restoration. Among the services the Center provides are [high-resolution mapping](#), land use change analysis, easy-to-use web application production and much more.

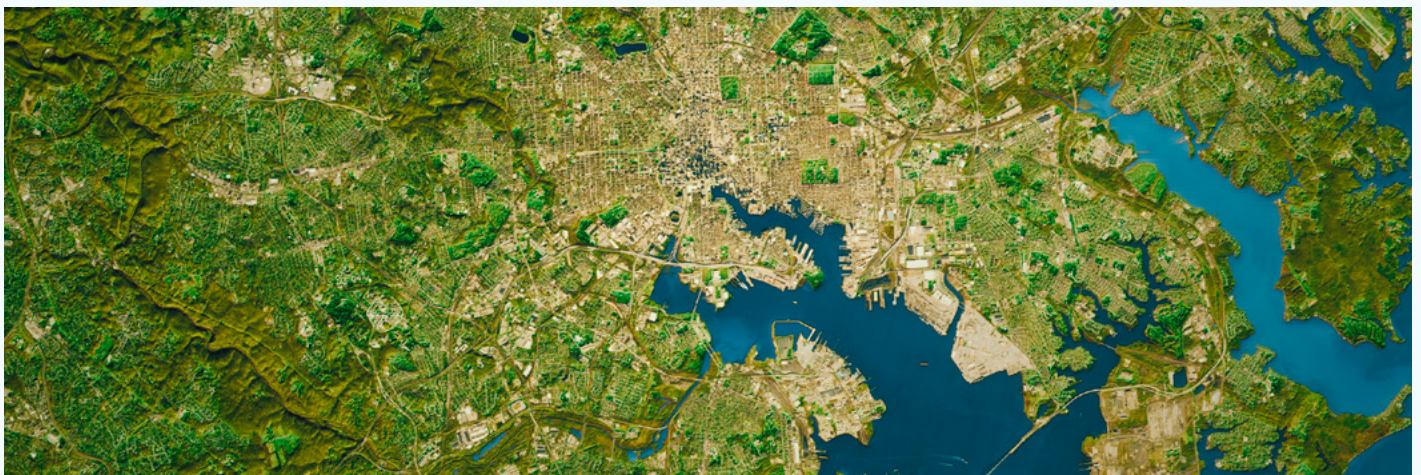
The Center [worked](#) with land trusts and conservation partners active in water-focused land protection to produce geospatial mapping tools that combine a wide array of relevant information in one site. These maps overlay locally important considerations for conservation—such as historic sites, tax parcels and development pressure—on features that are important for protecting water quality, such as karst topography, waterways, wetlands and

“Geospatial analysis is just a way of asking and answering a question about where things happen on the landscape.”

JEFF ALLENBY, The Center for Geospatial Solutions, Lincoln Institute of Land Policy

recharge areas. These overlays facilitate strategic planning to maximize impact on water quality.

These maps also provide information to support conservation of individual properties. Embedded within these parcel prioritization maps is [a web application that enables users to click on individual tax parcels and generate site-specific property reports](#). These property reports summarize all the relevant conservation information (including water quality features) that exist on selected parcels. Reports can then be shared with landowners and used to identify high-impact best management practices, target conservation areas and brainstorm other beneficial actions that can improve water quality onsite. An interactive version of the parcel prioritization tool for the West Virginia Safe Water Conservation Collaborative is [available online](#).



So what can land trusts do if they do not have access to a service provider like the Conservation Innovation Center? Searching out a geospatial service provider is much easier if you are explicit about the services you need them to provide. So, the first step is to **articulate the problem you are trying to solve**. Are you trying to address your community's most pressing water challenges, such as those you identify in question one of this section? If so, what are those challenges? Are you looking to supplement funding for a specific project or parcel? Are you just trying to determine what water resources are in your area in order to strategically plan or prioritize your future conservation work?

The next step is to **define the outcomes that you want to achieve**. Do you want to develop a program that responds to local water quality challenges—preserving recharge areas, restoring eroded streambanks, reducing

nonpoint source runoff and so on? Do you want to see a particular parcel protected? Are you after a strategic plan that positions your land trust to advance water quality protection and restoration as part of its future mission?

The problem you are trying to solve and the outcomes you want to achieve form the metaphorical bread of the sandwich. The 'filling' is how you will bridge them and different service providers are better equipped to help you build that bridge than others. For instance, municipal governments, water utilities and other public agencies (such as Extension agents) may be best equipped to provide you with data that is scaled to addressing local water-related challenges. Engineering firms (many of which are open to pro bono work for land trusts) can be excellent sources of parcel-specific information. Universities and other academic institutions have access to geospatial resources that cover large areas, such as watersheds.

Geospatial Resources

EPA—How's My Waterway: Online tool that shows local water quality information, watershed boundaries, current advisories, impairment status and pollutant dischargers.

EPA—Drinking Water Mapping Application to Protect Source Waters: Data repository for various geospatial information related to drinking water protection.

EPA—Environmental Justice Screening and Mapping Tool: Interactive map that allows users to examine and compare locations using high-resolution environmental and demographic information.

Envision the Susquehanna—RestorationReports.com

Lincoln Institute of Land Policy—Center for Geospatial Solutions

The Nature Conservancy—Migrations in Motion: Geospatial tool that aggregates scientific information to show the directions scientists expect animals to move in search of more hospitable climates. This can help inform decision-making to maximize the benefits of water quality projects.

The Nature Conservancy—Freshwater Resilience: Geospatial tool that aggregates scientific information to show the relative resilience of freshwater ecosystems. It can be used to inform decision-making on project prioritization and program development in ways that maximize the benefits of water quality efforts.

The Nature Conservancy—Conservation Gateway

U.S. Fish and Wildlife Service—National Wetlands Inventory: The principal source of geospatial information related to wetlands.

U.S. Forest Service—Forests to Faucets: Online tool that uses both biophysical and demographic data to characterize and map various features of water quality, including threats from climate change impacts, watershed characteristics, and drinking water uses in each watershed.

United States Geological Survey—National Water Dashboard: Easy-to-use interactive map that shows geospatial information on water quality, including surface and groundwater levels, atmospheric information and more.

USGS Regional Science Centers

USGS—SPARROW Models: Spatially Referenced Regression on Watershed Attributes, or SPARROW, models estimate water pollution—nutrients, sediments and dissolved solids—from waterways based on watershed features and pollution sources.

Stories of Land Trusts

Improving Water Quality

Through Land Conservation

This guide has provided a snapshot of the legal framework that governs water quality in the United States. It has outlined a process that land trusts can follow for working within this legal framework to embed water quality into their land protection activities. In the process, it identifies a wide array of resources that land trusts can use to support their work to protect and restore water quality through land conservation. The next, and possibly most important, section is inspiration for land trusts to engage in this important and meaningful work.

Since there is no better inspiration for land trusts than the work of other land trusts, this section features stories of 12 land trusts that have successfully improved water quality in their communities through land conservation. These projects illustrate the wide range of work that land trusts can do to protect and restore water quality, including partnering with local water utilities (Brandywine Conservancy, Northern Virginia Conservation Trust), and protecting wetlands (Northeast Wisconsin Land Trust). They also include land trusts advancing equity among Native American (Grand Traverse Regional Land Trust) and urban (Western Reserve Land Conservancy) stakeholders. Others show land trusts working through collaborative partnerships in which they are both leaders (West Virginia Rivers Coalition, Potomac Conservancy, Alliance for the Shenandoah Valley) and key supporters (Ozaukee Washington Land Trust, Black Swamp Conservancy). Still others demonstrate how land trusts are embedding water quality into their strategic plans (Harford Land Trust, Land Conservancy of West Michigan, Lower Shore Land Trust).

These stories also show that there are many potential starting places for this work. Some land trusts responded



to a crisis—a flooding event, an algal bloom or a chemical spill—while others began strategic conservation initiatives. Some land trusts were able to work with longstanding watershed groups and other organizations in their service areas that made natural partners while other land trusts had to take on this work themselves. The legal and political landscapes also vary: in the Chesapeake Bay Watershed, for instance, a robust crediting system gives local governments an incentive to be active partners in water quality efforts, but this system isn't common in other geographies.

One thing that all of these projects have in common is that they started by focusing on the needs and priorities of their own communities. They identified water quality challenges in their local areas and worked with the resources they had to address them. In other words, these case studies demonstrate that all land trusts—large and small, urban and exurban—can protect and restore water quality.



CASE STUDY

Partnering with the Grand Traverse Band of Ottawa and Chippewa Indians



Grand Traverse Regional Land Conservancy and Grand Traverse Band of Ottawa and Chippewa Indians (Michigan)



Agricultural Land



Leveraging Funding



Partnering with the Grand Traverse Band of Ottawa and Chippewa Indians



Strategic Conservation Planning

The accredited Grand Traverse Regional Land Conservancy has a long history of protecting water through land conservation—a history that positioned it perfectly to partner with the Grand Traverse Band of Ottawa and Chippewa Indians and access new federal funding through NRCS’ Regional Conservation Partnership Program.

“It starts with the fact that we’re surrounded by water and it’s the currency of our region, says Executive Director Glenn Chown. “If you ask people here what’s their number one priority, they’ll say water quality.” The Grand Traverse community’s focus on water quality motivated GTRLC to participate in pioneering work on a [Watershed Management Plan](#) that met EPA’s nine-element [standards](#). The Conservancy then worked with Grand Traverse Bay Watershed Center to deploy a data-driven parcel assessment process. This process uses geospatial information to prioritize land protection projects using water quality criteria.

The Conservancy’s experience with water quality work and ability to prioritize high-impact projects enabled it to play a vital role in bringing federal resources to the Grand

A Watershed Management Plan is a strategy and work plan for achieving water resource goals for a geographically defined watershed. The planning process uses a series of cooperative, iterative steps to gather input, assess existing conditions, identify and prioritize threats, define management objectives, and develop and implement protection, management or restoration strategies.

Traverse region. The RCPP was established by the 2014 Farm Bill, championed by U.S. Senator Debbie Stabenow (MI). It encourages partners to work together on joint initiatives that help producers increase the restoration and sustainable use of natural resources. GTRLC joined an initiative led by the Grand Traverse Band of Ottawa and Chippewa Indians called the Tribal Stream and Michigan Fruitbelt Collaborative.

The Collaborative has more than 20 partners including Leelanau Conservancy (accredited) and the Conservation Resource Alliance, who were among the first grantees to receive funding through the RCPP. Tom Nelson, executive director of Leelanau Conservancy notes, “It’s a new day for protecting water quality and working farms in the northern portion of the Michigan Fruit Belt.”

The Collaborative aligns organizations with complementary capacities and coordinates them to protect and restore water quality in the Grand Traverse region. For example, the Grand Traverse Band’s [Natural Resources Department](#) works closely with the Conservation Resource Alliance and Grand Traverse County Conservation District to conduct water quality restoration projects—stream crossing improvements, streambank stabilizations and fish passages. GTRLC, Leelanau Conservancy and other conservation-oriented organizations permanently protect properties through conservation easements purchased with public funding.

“At the Conservation Resource Alliance, we view this effort as an innovative approach to connecting key Farm

Bill programs with locally designed conservation work,” says Director Amy Beyer. “CRA will work side by side with our tribal and land conservancy partners to restore and protect the most threatened water, land, fishery and wildlife resources in northern Michigan. We expect to multiply every conservation dollar invested and help set the stage for a more streamlined, higher impact, conservation future.”

GTRLC found that the Grand Traverse Band is an invaluable partner in their water quality work. Each partner brings its own points of view, talents, resources and knowledge to the table, which ensures a richer perspective and more effective outcomes for water quality work accomplished through the Collaborative. For example, Collaborative members can better and more authentically articulate how their land protection work contributes to sustainable local fisheries upon which the Grand Traverse Band depends. The Grand Traverse Band also administers the Collaborative and the multiple federal and state grants it has received, which frees up critical capacity for its land trust partners.

“The Grand Traverse Band of Ottawa and Chippewa Indians are grateful for Senator Debbie Stabenow’s forward-thinking advocacy for the Great Lakes,” Mary Pelcher, GTB Tribal Manager says. “Such foresight has led to this development of an innovative mechanism of support to bolster the efforts of a broad partnership that is actively removing obstacles infringing upon traditional lifeways, while also providing meaningful and lasting protection.”



CASE STUDY

Taking a Collaborative Approach in the Shenandoah Valley



Alliance for the Shenandoah Valley (Virginia)



Collaborative Partnerships



GIS



Leveraging Funding



Strategic Conservation Planning

Alliance for the Shenandoah Valley leads the [Shenandoah Valley Conservation Collaborative](#) (SVCC). The SVCC was created in 2017 with support from the Alliance’s Chesapeake Land and Water Initiative. It is a coalition of land trusts, watershed groups, regional nonprofits and agency partners working toward shared goals of increasing water quality, agricultural vitality and rural landscape protection.

During its initial attempt at identifying projects to advance through the collaborative, SVCC deliberately tried to keep it simple. It limited its focus to two counties and six partners. These partners were able to find a strategic direction that united their land protection and water quality work with community priorities. In addition to agriculture and drinking water, the community prioritizes tourism—there are many water-based opportunities for outdoor recreation in the Shenandoah, such as canoeing and kayaking. SVCC partners know that it hurts the local economy if visitors see trash in the rivers, experience fish kills or feel like it’s unsafe to swim. And the need for better water quality is apparent: In August 2021, the Virginia Department of Health issued a recreation

water advisory on 50 miles of the North Fork of the Shenandoah, advising no public contact with the water due to a harmful algal bloom caused by excessive nitrogen and phosphorus pollution.

SVCC’s collaborative approach helps it respond to the many different water quality challenges (and opportunities) in its communities. It can call on members that specialize in different conservation actions. For example, when it comes to implementing water projects, land trusts can focus on acquisition, Trout Unlimited on stream restoration, and watershed groups on activities like tree planting and agricultural buffer restoration. This broad expertise makes them strong partners for localities and cost-share agencies. All the team needed was the right playbook.

“Each partner already had their own priorities,” says Kate Wofford, executive director of the Alliance for the Shenandoah Valley. “The thing that was new was layering those priorities.” This layering refers to the geospatial prioritization process that SVCC used to objectively identify land protection projects that would maximally advance the shared goals of SVCC’s member organizations.

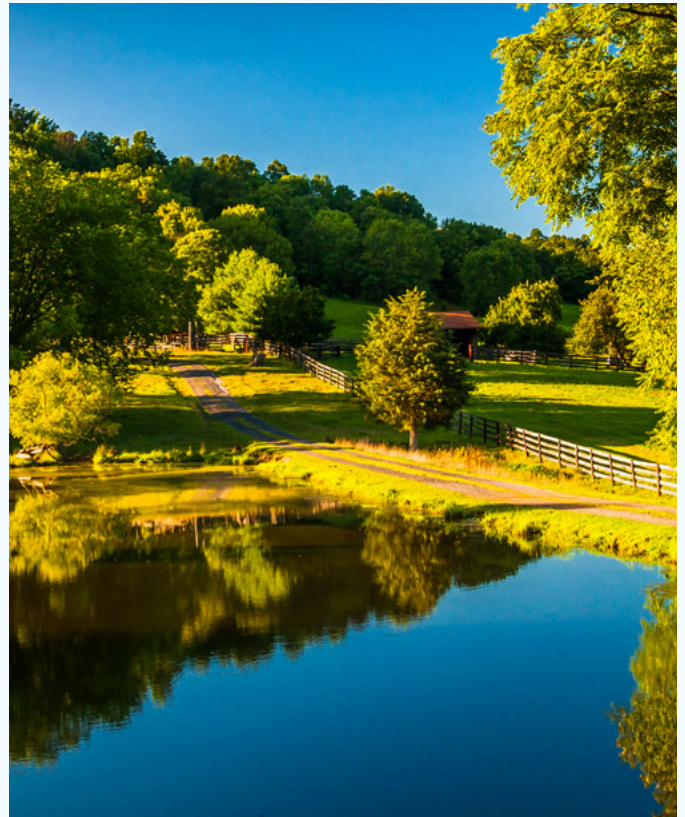
As with many collaborative partnerships in the Chesapeake, the next step to identifying and prioritizing work to pursue together was sorting through the sheer volume of data available to them. SVCC considered geospatial data layers, such as:

- Water quality data from the Bay Model available through Trout Unlimited and local watershed groups
- Land trusts’ county-level parcel data and lists of landowner contacts
- Historic battlefields, an important cultural asset in the region
- Virginia Natural Heritage Program data on native plant and wildlife species and ecologically important land
- Location of prime soils, public lands and natural preserves



After SVCC partners determined the data that best reflected their collective priorities, they needed to translate the data into a format they could use to inform their conservation decisions. Additional financial support from the Land Trust Alliance enabled SVCC to hire the GIS expertise necessary to conduct the geospatial parcel prioritization. The analysis identified 20 to 40 of the highest priority sites to protect, all of which were agreed upon by SVCC partners.

The collaborative's subsequent success in starting to protect these sites gave the team strong motivation to continue. During the collaborative's second phase, the SVCC broadened its ambitions to six counties, more partners and more priorities. Their priorities included an increased emphasis on climate change and responding to new development pressure and drinking water—the Shenandoah River supplies drinking water for local towns and cities and Washington, D.C. SVCC also created a revolving loan fund for landowners who need temporary, “gap” funding to cover due diligence expenses associated with donating or selling conservation easements. With demonstrated success in its first phase, and a broader plan and scope of work going forward, SVCC was able to secure a significant multi-year grant from the National Fish and Wildlife Foundation to expand its activities.



“Agriculture is the backbone of our economy here. Clean water practices, like fencing cattle out of streams, is a high priority. The farming community is aware of increased nutrient runoff regulations and has concerns about the future.”

KATE WOFFORD, Alliance for the Shenandoah Valley



Restoration at Redhorse Bend Preserve. Photo courtesy of Black Swamp Conservancy.

CASE STUDY

Protecting Drinking Water Through Restoration



Black Swamp Conservancy (Ohio)



Agricultural Land



Drinking Water



Leveraging Funding

The Great Black Swamp was a vast network of wetlands in northwest Ohio, northeast Indiana and part of Michigan that was drained and settled in the second half of the 19th century. It is now highly productive farmland. A consequence of this agricultural productivity is nutrient pollution, a primary contributor to algal blooms in Lake Erie. A massive algal bloom in 2014 produced dangerous toxins in the water supply of Toledo, Ohio. Half a million people were warned not to drink—or even touch—the water coming out of their taps.

“We had started doing habitat restoration work to reduce the amount of nutrient runoff from entering the waterways about a year prior to that,” says Executive Director Rob Krain. “But that was the event that really started us on our current path.”

Black Swamp Conservancy was formed in 1993 to protect and preserve natural and agricultural lands in northwest Ohio for the benefit of future generations. With a staff of five and a dedicated board, the accredited organization employs two key strategies to accomplish this mission: holding conservation easements and acquiring land to own and manage as nature preserves. These strategies have proven to be highly successful in protecting land in northwest Ohio. However, in the early 2000s Conservancy staff and board grew aware that protection didn’t end at acquisition and they recognized the importance of identifying and acquiring high priority parcels for the purpose of restoring natural habitats—such as wetlands—to protect soil health and improve

“It takes a new skillset. You need all the science knowledge that a land trust has, but also a new kind of knowledge.”

ROB KRAIN, Black Swamp Conservancy (accredited)

water quality by reducing nutrient loading and sediment deposition downstream. By the time of the Toledo algal bloom, the Conservancy had already started to shift its focus toward restoration work in addition to land protection and was, therefore, positioned to engage on water quality issues.

Krain described the challenge of learning how to take the additional step of addressing nutrient problems through restoration. For instance, it is difficult to capture and filter runoff in engineered landscapes that have been drained for agriculture through field tiles, which often go under field buffers and filter strips that would otherwise intercept stormwater flowing from the field. Addressing situations like this one requires more complicated and larger-scale restoration, such as re-establishing wetlands in low-lying areas on unproductive farmlands. Managing contractors for larger-scale restoration projects can be difficult for a small land trust like Black Swamp Conservancy, although having a staff member or partner with an engineering or consulting firm background is often helpful.

Despite the associated challenges, the Conservancy’s restoration projects created immense habitat benefits: “It’s amazing to see how quickly species come in and adapt and use these places.” But as with other land trusts, a major challenge for the Conservancy was quantifying the water quality impacts of their work. How can work on one parcel have any impact on a watershed the size of Lake Erie? “It’s a drop in the bucket,” says Krain. The Conservancy partnered with Kent State University to conduct edge-of-field testing and research on its first major restoration project to see how much nutrient runoff was reduced as a result of the restoration work. This research showed a 40 percent reduction in nitrogen and phosphorus leaving the subject fields. The Lake Erie & Aquatic Research Network, a collaborative of 20 Ohio universities and other institutions, is evaluating subsequent projects.

Having this information about the benefits of restoration proved to be critical for leveraging funding to support the Conservancy’s work. In 2019, the State of Ohio launched H2Ohio, a comprehensive water quality initiative to strategically address the state’s serious water issues. Program targets included reducing phosphorous runoff from farms by using proven, science-based nutrient management best practices and the creation of phosphorous filtering wetlands. The Ohio General Assembly allocated \$172 million for 2020–2021. The state and partners identified cost-efficient practices to address runoff, many of which focus on land protection and restoration.

The adage “Luck is when preparation meets opportunity” definitely applies here. Black Swamp Conservancy was both lucky and prepared when it was awarded funding for four restoration projects in the first year of the H2Ohio program. The Conservancy’s restoration work continued with another four projects in the second year of the program. Readiness is key to taking advantage of opportunities when they arise.



Black Eyed Susan at Restoration Area of Redhorse Bend Preserve. Photo courtesy of Black Swamp Conservancy.



CASE STUDY

Removing Barriers and Accelerating the Pace in Agricultural Communities



Brandywine Conservancy (Pennsylvania)



Agricultural Land



Community-Centered Conservation



Leveraging Funding

In Pennsylvania's commonwealth system, where municipalities (cities, boroughs and townships) enjoy home rule authority, [Brandywine Conservancy](#) (accredited) has established invaluable relationships with local governments that are built on decades of partnership and mutual trust. With a staff of 25 and an active board, the Conservancy has conserved the land, water, natural and cultural resources of the Brandywine-Christina watershed since 1967. The Conservancy's Municipal Assistance Program has enabled it to partner with local governments on zoning, natural resource ordinances and conservation design rules, rather than being resigned to influencing these laws from outside the process.

These municipal relationships are key to addressing one of the biggest remaining challenges in water quality work: reducing nutrient pollution from agricultural areas. Nutrient loading data from the Chesapeake Bay Model, for example, [clearly indicates](#) that the primary sources of these excess nutrients in the Bay are farmlands in the Lower Susquehanna Watershed of Pennsylvania. As in the Lower Susquehanna Watershed, the area of southeast Pennsylvania where the Conservancy operates has municipal and county planning, prioritization and land protection programs in place to address nonpoint source water pollution from farmlands. Brandywine Conservancy is faced with the task of supporting these municipal programs to accelerate the pace of land protection and implementation of other water quality best management practices.

According to Director of Conservation and Stewardship Stephanie Armpriester, there are plenty of farmers in their watershed who are willing to protect and restore their lands and install best management practices. However, few of these producers are willing and able to cover the associated costs of developing a farm-specific conservation plan and implementing its recommendations. To address this hurdle, Brandywine Conservancy decided to hire local [Technical Service Providers](#) to develop conservation plans more quickly. Conservancy staff also serve as farmers' primary points of contact. "There's going to be an engineer, a surveyor, a concrete guy; it's going to be 12–15 different people coming to (a farmer's) private home while they're trying to farm," says Director of

“Everything is hyper local in Pennsylvania.”

GRANT DECOSTA, Brandywine Conservancy (accredited)

Community Services Grant DeCosta. “So we try to be the one face they can always go to.”

The Conservancy also supports fundraising to implement conservation plan recommendations that is workable for farmland owners. Farmers often must cover upfront costs of implementing conservation practices and wait for reimbursement from federal and state funding programs. This has prevented many farmers from participating. Pennsylvania dairy producers in particular have struggled with a depressed market and low profits, and many do not have resources available to front the costs of conservation practices. The Conservancy helps to remove this funding barrier by tapping outside funding to cover upfront project costs. For example, the Conservancy has used grants from the National Fish and Wildlife Foundation and Pennsylvania Growing Greener, a state grants program, to help meet the cost-share requirements of federal grant programs. They also leverage municipal relationships to identify funding opportunities through local government programs.

Over time, staff realized they had a valuable list of best management practices recommended by these plans that were just waiting for funding—a list of “conservation ready” projects. One of DeCosta’s favorite conservation practices to support is gutters for outbuildings. “It’s often something farmers don’t want to install because they don’t have the money for it, but as soon as you put a roof gutter on, it’s an automatic improvement; and then you follow the water down and ask where it’s going to go next. Sooner or later it always ends up at the stream.”

When asked about the challenges in outreach to an area where many farmers are Amish or Mennonite, DeCosta reflected, “You need to talk to them about the stream behind their own farmyard. The cleaner the water the cows drink, the higher their yield. Clean water leads to less hoof problems, mastitis. And whatever leaves your farm is going down to your neighbors; their children are drinking what you’re spraying on your farm. That message has been very successful. We have a lot of well water out here; I think people get it.”

Still, DeCosta says there are many people for whom “meat comes from the grocery store and water comes from a pipe.” Some processes like ground water or infiltration are hard to explain. “Every time somebody talks about impervious surfaces, you’re going to hear the words ‘rain tax.’” According to Brandywine Conservancy, the trick is to keep focus on the hyper-local: this mud puddle on this farm. Sometimes you start with a gutter.



THE LAND TRUST ALLIANCE COMMISSIONED A FOCUS GROUP IN 2018 on working with Plain Sect farmers that confirms that this community is willing to engage in voluntary conservation practices when approached thoughtfully. The report is available on the [Learning Center](#) (log-in required).

CASE STUDY

Incorporating Climate Change into Planning for Drinking Water Protection



Land Conservancy of West Michigan



Climate Resilience



Drinking Water



Strategic Conservation Planning

Most of the land trusts interviewed for this guide agreed that climate change impacts their work. Many land trusts are currently working to incorporate resilience data into their decision-making on land protection and stewardship. The accredited [Land Conservancy of West Michigan](#) is taking this one step further by integrating climate change into its plans for protecting drinking water. Since 1976, the Conservancy, now with a staff of 11 and a committed board, has conserved over 12,000 acres in eight counties of western Michigan.

Along with common features such as rivers and wetlands, LCWM's plan focuses on recharge areas and soil characteristics in the Pere Marquette watershed. Working with academic partners and watershed groups, LCWM staff incorporated the Nature Conservancy's [Resilient and Connected Landscapes](#) into their prioritization—and pivoted their focus when they saw the results.

An unexpected result was that smaller, glacially sourced wetlands provided important resilience in an area that hadn't previously been a focus because it was largely



suburban. “We’re not looking to go small in those areas,” says former Land Protection Director April Scholtz. “We want it to be a mixture of stewardship, conservation easements and community work to create a matrix of projects.”

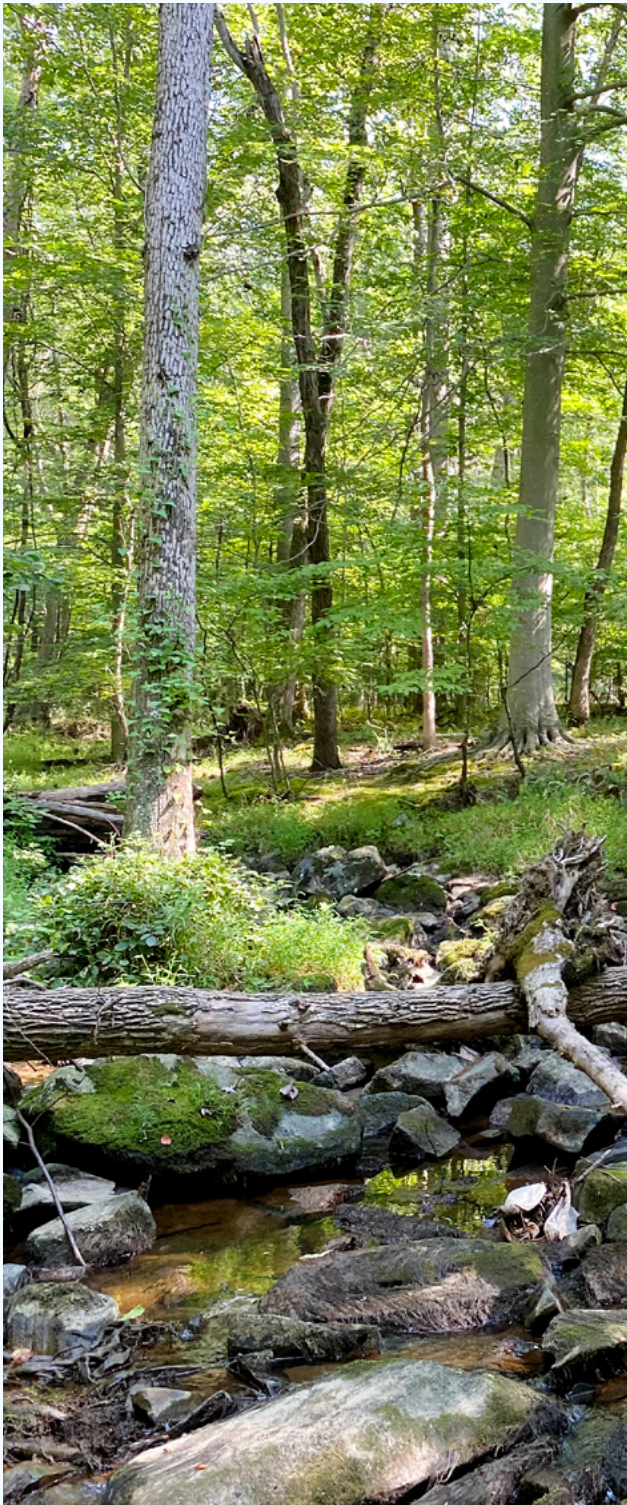
Public outreach on climate resilience-focused projects can be difficult and the impact of individual projects on a large system can be hard to grasp. River projects that “reduce velocity” or “drop sediment” don’t necessarily resonate for urban or suburban residents who are turning on their taps downstream.

Instead, April recommends partnering with watershed groups as they prepare approved Watershed Management Plans for waters in a land trust’s service area, particularly the mapping elements. Without an approved plan, it’s difficult to get funding. If land trusts engage, they can ensure that intact wetlands and natural areas are included in these plans, particularly further inland away from the streams. She calls it a low-cost way to engage that will directly influence state and federal funding.

The Land Trust Alliance’s [Land and Climate Program](#) offers land trusts the strategies, training and tools they need to both adapt to and mitigate climate change in their land conservation work.

“Water provides resilience in climate change. That is where the resilience is.”

APRIL SCHOLTZ, Land Conservancy of West Michigan



Newly preserved stretch of Grays Run. Photo courtesy of Harford Land Trust.

CASE STUDY

Building Capacity at the County Level



Harford Land Trust (Maryland)



GIS



Strategic Conservation Planning

The experience of [Harford Land Trust](#) shows how using geospatial data and other supporting information can support organizational decision-making to better advance water quality goals. Founded in 1991 and with a staff of two and a working board, Harford Land Trust has protected over 2,600 acres in northern Maryland. As with other land trusts profiled in this guide, Harford Land Trust wanted to use more objective measures to assess potential land protection projects but did not know where to start. They could choose from an abundance of data, but this data was not necessarily in a form they could use to help inform their work.

With funds from the Alliance's Chesapeake Land and Water Initiative, Harford Land Trust partnered with the Conservation Innovation Center (CIC) at Chesapeake Conservancy. Their goal was to understand and quantify water quality benefits of land protection projects down to the parcel level and demonstrate these impacts to funders. They started by identifying data that was relevant to the organization's goals, including adjacency to critical natural areas, landcover and scenic/cultural values. They also incorporated other factors that are more relevant to water quality and are not commonly used to their full potential, such as slope and enhanced water flow paths. CIC was also able to bring in the results of other sophisticated geospatial calculations that additionally clarified the water quality benefits of individual parcels, such as aquatic life benefit ratings, a stormwater loading dataset and the Maryland marsh protection potential index. CIC's geospatial analysis combined these various datasets to generate scores for individual conservation projects. These scores included both an overall quality

score and individual feature scores that assessed parcels' importance for agriculture, water quality, wildlife habitat and biodiversity.

Chesapeake Conservancy calls this approach “[precision conservation](#).” Using detailed imagery of the land and geospatial analysis tools, it can produce maps that quantify important features for water quality, such as surface water flows at the parcel scale. It also allows it to see when, for example, a typical forested buffer might not be effective at capturing sediment and nutrients from a farm field that is drained by a tile system. Access to these precision conservation technologies enables Harford Land Trust to now easily identify properties that meet its desired conservation criteria and target its efforts on protecting these parcels.

Harford Land Trust Executive Director Kristin Kirkwood says that one of the most valuable outcomes of the parcel prioritization process was finding properties that were not already on her radar. It also allows her to prioritize between projects that come in the door and how the land trust strategically pursues them—decline to support, accept as a donation, support with local fundraising or write big-ticket grant applications to acquire and restore. She adds that most funders have come to expect this level of analysis. In a wetlands grant application, for example, the grantor expects to see a high degree of strategy behind why a parcel is being targeted and

prioritized. Even so, Kirkwood emphasizes that the data is still only the beginning: “No dataset trumps your knowledge of your service area.”

The next step for Harford Land Trust is to extend this mapping capability to its county partners. In its service area, there are organizations that plant trees, test streams for water quality and still others that preserve land, but they don't all work together—yet. “Maryland is very county-centric, so working at that level is great,” says Kristin. Her goal is to start organizing partners together now so when the next big opportunity comes, they are ready.



Recently preserved stretch of Broad Creek. Photo courtesy of Harford Land Trust.

“In terms of number of properties, we didn't designate ‘top 10’ or ‘top 50’—land trusts know you need as many irons in the fire as possible. Some properties go nowhere, and some materialize ten years later.”

KRISTIN KIRKWOOD, Harford Land Trust

CASE STUDY

Collaborating with Water Utilities



Northern Virginia Conservation Trust



Drinking Water



Leveraging Funding



Urban Conservation

The [Northern Virginia Conservation Trust](#) (accredited) preserves the land, water and character of Northern Virginia with a staff of six and a strong board. Having conserved more than 6,000 acres, NVCT is doing critical water quality work through its partnership with county government and water utilities. Water utilities in Virginia tend to avoid conflict with county development policies. They are good partners for land trusts, says NVCT Executive Director Alan Rowsome, because both organizations can focus on creating good policies and programs that benefit residents.

The executive director and board chair of NVCT met annually with their local water utility, just to check in on each other's projects. These meetings did not always lead to anything, but they slowly built trust. The water utility sent staff to conservation roundtable events and generally made themselves accessible to the community, which is not always the case for other water utilities. It was clear to Rowsome that the utility and the land trust had shared goals and problems. "The more I heard them talk about what their challenges were, the more I thought they were challenges we were uniquely qualified to help them to solve."

For instance, the water utility was growing concerned about water quality in the Occoquan reservoir, which provides much of the drinking water to northern Virginia. Land around the reservoir was being increasingly subdivided and developed. This development was reducing tree canopy, expanding impervious services, increasing chemical use from landscaping and causing more nutrient buildup in the water. The utility also knew more subdivisions around the reservoir could create more landowner conflicts that would cost them additional staff time and resources to mitigate.

Although it had existing relationships with landowners, the utility was interested in how NVCT ensured permanent protection, how it worked with landowners and lessons it had learned in the process. "Early on we were kind of talking past each other," Rowsome recalls. "Conservation or finances being at the heart of it, either way, they came to it from the bottom line to not raise rates on users." NVCT was able to support the utility's goal by focusing conservation efforts in specific areas of the reservoir's watershed and conducting education and outreach.

It was many years before any funding was available for this work. Now, NVCT receives significant funding from counties and water utilities, which enables it to serve as an intermediary between local agencies and other organizations working in the watershed. As a result of these partnerships, the land trust has seen its community standing and credibility increase, says Alan. The utilities generally prefer to avoid the spotlight and they appreciate that NVCT can keep the focus on the good work happening across the watershed.

Yet despite the significant support that NVCT receives from these agencies, NVCT manages to keep its focus on its broader mission. "We're not signing up to be a land acquisition team for reservoir purposes; we're looking for properties of multiple benefits. It has to make sense for you first and foremost."



Private conservation of important watershed lands in Northern Virginia. Photo courtesy of Matt Gerhart.



CASE STUDY

A Small Staff Doing Big Things in a Big Watershed



Northeast Wisconsin Land Trust



Collaborative Partnerships,
Partnering with the Oneida Nation



Flood Management



Leveraging Funding

Talk about a regional approach to a landscape—Green Bay is the world’s largest freshwater estuary and provides a third of the water flowing into Lake Michigan. It’s also a community with a strong sense of identity connected to its watershed. At one time the Fox River, a major tributary to Green Bay, was considered the most heavily industrialized river in North America—primarily for manufacturing paper. Today Green Bay is a test case of community resolve to remediate and restore ecosystems in the Great Lakes Basin and a proving ground for water quality protection and adaptive restoration.

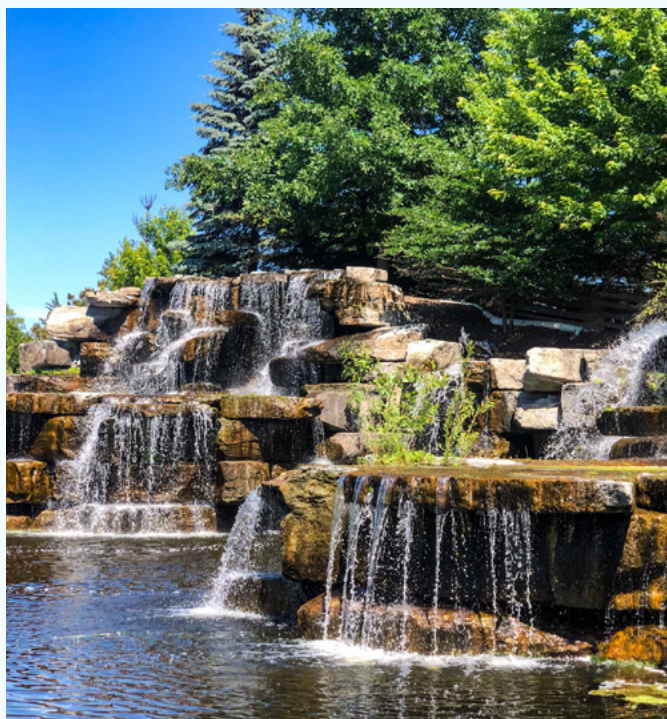
Water runs through the veins of the accredited [Northeast Wisconsin Land Trust](#), as it was founded as a result of the 1993 *State of the Bay: A Watershed Perspective* report, published by the Institute for Land and Water Studies, University of Wisconsin-Green Bay. The report stated, “We cannot clean up lower Green Bay unless we clean up Lake Winnebago. We cannot clean up Lake Winnebago unless we clean up the Fox and Wolf rivers.” From its founding and now with a staff of four and a committed board, NEWLT’s priorities have always been tied to water quality. The thin soils on top of dolomite in the region mean that water moves easily between farmland and groundwater, so protecting drinking water is an obvious priority.

“Our approach is to layer,” says Deb Nett, executive director at NEWLT. “Layer partners and funders and priorities and then cherry-pick to get the best projects you can; work harder to get the best ones you can, where everyone can see the direct benefit ... Don’t pick iffy projects.” And while water quality protection is at the core of every project, there are many benefits to the work the land trust is doing: wildlife habitat, scenic views, cultural preservation, education and research sites, wetlands restoration and outdoor recreation.

Flood mitigation is often a concern, and the land trust has protected wetlands adjacent to the Bay in order to absorb high water. Addressing the dead zone in the southern end of the Bay close to Wequiock Creek is also a priority. NEWLT has successfully leveraged funding from many sources—state surface water planning grants, North American Wetlands Conservation Act grants, funds from Natural Resource Damage Assessment, Section 6 endangered species grants, state and federal coastal grants and local foundation funding.

When asked about her success, Nett credits a long list of partners, and it isn’t just about funding—it’s about collaboration. “TNC has great tools and USFWS has amazing knowledge and funding sources. Ducks Unlimited and Wisconsin Waterfowl Association are important partners for us. We partner with local governments at all levels. We do a lot with local universities—if we need data on bats that use the riparian corridor, or a biotic inventory, pollinator research, or information on cultural assets and archeology—they are there to help. We work in concert with the Oneida Nation to identify and honor cultural sites and traditions. We’re doing a diversity program. In our focus area, we’re not just looking for funding; we can’t do this on our own and we seek collaborative partnerships.”

NEWLT focuses on fee land acquisition and, without a full-time stewardship staff person, partners with others on restoration projects. “We have a wealth of good opportunities and we have yet to run out of good prospects,” says Nett. “We all have a niche to fill and right now there’s no one else doing acquisitions the way we do ... while there’s money for acquisition, that’s what we’re going to focus on.” Read about one such project, the [Oconto Preserve](#), which exemplifies this land trust’s dedication to working with partners for increased impact on protecting water quality in the Green Bay watershed.





Farm in Southeast Wisconsin. Photo courtesy of DJ Glisson II, Firefly Imageworks.

CASE STUDY

Flood Management Through Healthy Landscapes



Ozaukee Washington Land Trust (OWL) and The Conservation Fund (both accredited)



Flood Management



Agricultural Land



Collaborative Partnerships



Community-Centered Conservation

Greenseams® is a collaborative flood management initiative led by the Milwaukee Metropolitan Sewerage District (MMSD) and The Conservation Fund. The program’s goal is to prevent flooding and associated water pollution through permanently protecting key habitats within the Milwaukee River Watershed. The program focuses on preserving water-absorbing soils in wetlands and flood plains as well as the adjacent uplands, primarily within urban and suburban areas.

This “green infrastructure” is then maintained as open space and planted with native species, creating important

wildlife habitat and enhancing the land’s ability to absorb and hold water to reduce peak flows and mitigate flooding downstream. The program has permanently protected properties that have the capacity to store and slowly release an estimated 1.3 billion gallons of water.

The **Ozaukee Washington Land Trust (OWL)** has been a partner in the Greenseams® initiative for more than a decade. “The Milwaukee River flows through every type of landscape in the region, including forests, farm fields and urban centers, before it reaches Lake Michigan,” says Tom Stolp, executive director. This water quality program meshes well with OWL’s regional goals of maintaining natural landscapes benefitting fish and wildlife as well as providing opportunities for much needed outdoor recreation.

MMSD’s **Working Soils®** program compliments its Greenseams® program and protects agricultural lands in the Milwaukee River watershed to achieve goals that include building soil health and improving nutrient management on the land. Building soil health by promoting conservation farming practices increases infiltration in the fields, thereby mitigating downstream flooding, enhancing water quality through decreased runoff and erosion, and maintaining productive farmland.

These programs provide important community benefits beyond flood management. They have also been utilized to advance the **Making Allies for Healthier Communities** effort. The Land Trust Alliance initiated this pilot project to demonstrate how land trusts can address community needs through conservation and collaboration. Partners

in Making Allies included OWLT, MMSD, The Conservation Fund and Fondy Food Center—Milwaukee’s oldest and largest year-round farmer’s market.

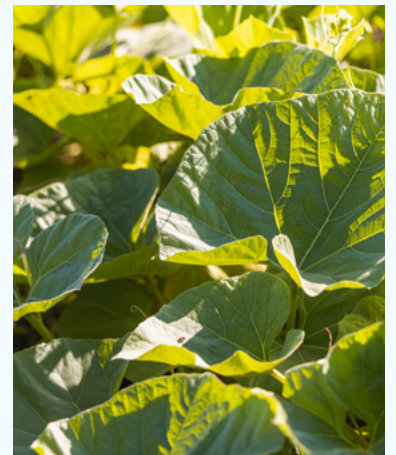
The initiative began with a desire to help land trusts better protect water resources in the Great Lakes basin. The Making Allies partners did not stop there—the project also addressed the community needs of supporting farmers who supply low-income neighborhoods on the north side of Milwaukee with fresh and affordable produce.

Beginning with the criterion that this project must improve water quality, the partners set out to search for properties that qualified for the Working Soils® program. But just as vital was the desire to find the right farm—one close enough to the Milwaukee farmer’s market to make it economical to transport produce, one within or close to the geographic area served by OWLT, one with sufficient acreage to qualify for Natural Resources Conservation Service’s Regional Conservation Partnership Program funding, and one that fulfills Fondy’s goal to provide land security for beginning and immigrant farmers. Oh, and one other detail—they needed a willing seller. Together they found the right farm!

The project was structured so a conservation easement was purchased with funding from the Working Soils® program and NRCS’ RCPP program. Then OWLT raised the balance of the purchase price from private sector



donations. OWLT acquired the property in early 2020 and is working with NRCS and other partners to improve the degraded fields through conservation installations and practices (grass waterways, cover crops and no-till practices). These practices are rebuilding soil health and productivity so OWLT can make the land available to vegetable farmers—at a more affordable price because of the conservation easement restrictions. Required conservation practices will ensure these healthy soils absorb precipitation and reduce flooding downstream.



Photos on this page: Hmong farmers growing crops in greater Milwaukee. Photos courtesy of DJ Glisson II, Firefly Imageworks.

CASE STUDY

Building Back Better After a Drinking Water Disaster



West Virginia Rivers Coalition and
Potomac Conservancy



Collaborative Partnerships



Drinking Water

A leaking chemical tank spilled into the Elk River in January 2014. It left 300,000 people without safe drinking water in and around the state's capital city of Charleston. The spill made national news and galvanized community concern about safe drinking water, particularly among parents. The spill also compelled [West Virginia Rivers Coalition](#) to establish the connection between its clean water mission and ensuring safe drinking water. "We broadened our base in a significant way," says Angie Rosser, executive director of West Virginia Rivers Coalition. "Even with people who would never consider themselves activists."

West Virginia Rivers Coalition is an advocacy organization and its initial response focused on improving state policy. Despite working with a state legislature that is "industry-friendly," WVRC successfully supported a new law ([SB 373](#)) that requires all public water systems to enact source water protection plans. These source water plans must include water management strategies, which can include land conservation, and define zones of critical and peripheral concern.



WVRC also created the [Safe Water for West Virginia program](#) to assist utilities and communities to conduct outreach, education and events highlighting clean water. Along with this program, WVRC also formed the [Safe Water Conservation Collaborative](#). The collaborative organized around protecting and restoring land for the benefit of safe drinking water in the Eastern Panhandle of the state.

With support from the Chesapeake Land and Water Initiative (LWI), this group employed a collaborative partnership model that brought together WVRC, the accredited Potomac Conservancy, local land trusts, farmland protection boards, watershed groups and water utilities. Together, these organizations and agencies had the additional capacity and technical expertise necessary to conserve land in zones of critical and peripheral concern outlined in the new source water protection plans—something the local water utilities would not have been able to do alone. "A water utility, a land trust and a community group is a powerful coalition," Rosser says.

Still, implementation of source water protection plans is "an unfunded mandate," according to Rosser; the small

"A water utility, a land trust and a community group is a powerful coalition."

ANGIE ROSSER, West Virginia Rivers Coalition



Activists at the West Virginia Capitol Building. Photo courtesy of West Virginia Rivers Coalition and Potomac Conservancy.

grant program administered by the State Department of Health and Human Resources provides funding typically for monitoring or early warning systems. The collaborative partners had to find other ways to conserve land in support of these plans.

They started by identifying the most important properties to target for conservation. With support from the LWI, collaborative partners worked with Chesapeake Conservancy to develop a parcel prioritization tool. The tool aggregated data on water-relevant factors, such as tree canopy, karst geology and source water areas to highlight key parcels that would have the highest benefit to water quality if they were protected and restored. As

a result, forested riparian buffers emerged as a major focus for protection due to their benefits to both stream quality and drinking water. The tool also had embedded tax and parcel data that enabled collaborative partners to easily generate a list of landowners who owned priority properties, which greatly facilitated the collaborative's subsequent outreach and education efforts.

An additional benefit of working in a collaborative partnership was the community engagement that partners were able to achieve by working together. WVRC had wanted to do more to engage the public in work that prevented future water quality pollution, an issue about which most Americans express significant concern. By working with water utilities, and, by extension, all of their customers, the collaborative was able to hear concerns directly from community members and more readily respond to these concerns. Rosser recalls especially poignant meetings with the NAACP, who compared the spill in West Virginia to the Flint water crisis.

Rosser says that West Virginians are living in the shadow of what happened that day, as are other communities across the nation, whether they're aware of it or not, that have experienced drinking water contamination. These communities wrestle with the choice to be reactive and deal with the consequences of inaction or do everything they can to plan ahead and prevent future disasters. "It wasn't one bad day," says Rosser, "For us, it was weeks and months. It takes a disaster to awaken us and remind us why we have to care about what happens upstream; even if it's inconvenient for someone. It's an important investment to make."

"It takes a disaster to awaken us and remind us why we have to care about what happens upstream; even if it's inconvenient for someone. It's an important investment to make."

ANGIE ROSSER, West Virginia Rivers Coalition

CASE STUDY

Urban Equity in the Face of Aging Infrastructure



Western Reserve Land Conservancy (Ohio)



Flood Management



Urban Conservation

Like many older cities, Cleveland has a combined sewer system, in which both the stormwater and sanitary sewer water collect in the same pipes. This means that during storms, when the volume of storm water exceeds the capacity of wastewater treatment plants, sewage bypasses the treatment plants and is discharged directly into local lakes and streams. Beginning in 2011, a 25-year, \$3 billion consent decree between the city and the EPA called “[Project Clean Lake](#)” proposed using green and grey infrastructure to reduce the amount of pollution entering Lake Erie by 4 billion gallons per year.

The accredited [Western Reserve Land Conservancy](#), with a staff of 40 and a dedicated board, has worked on urban projects for more than a decade and has an urban lands program in the heart of Cleveland, in partnership with the Northeast Ohio Regional Sewer District, Cuyahoga Land Bank, and stormwater coordinators of nearby municipalities. These partners and the Conservancy’s legal and real estate experience enable them to work through highly complex projects, including assisting residents who choose to relocate to less flood-prone properties.

The Northeast Ohio Regional Sewer District’s stormwater master plan identifies high-priority areas for conservation and acquisition. These areas often include houses experiencing significant flooding or that are in a location where new infrastructure is required.

Western Reserve Land Conservancy serves as a contractor through a three-year commitment to do conservation planning, acquisition and relocation projects on behalf of the district. All relocation is entirely voluntary, with no use of eminent domain. The district is responsible for delineating wetlands and infrastructure engineering, while the land banks handle demolition. WRLC retains real estate experts to proactively target properties that come up on the market. For residents who choose to relocate to higher ground, the program also offers a no-to-low-cost lease.



“This is community impact, with land as the medium.”

ISAAC ROBB, Western Reserve Land Conservancy

Although Cleveland is right on Lake Erie, WRLC’s Vice President of Planning and Urban Projects Isaac Robb says that the residents don’t necessarily have water at the top of mind. “We’ve had a lot of development in areas that are contributing to flooding and runoff,” he says.

“Our urban projects are the inverse of what was considered “traditional” conservation—protecting large acreages with long-term impacts. By contrast, these projects are directly adjacent to where residents live, work and play downtown and we see immediate positive impacts on the surrounding community,” Robb says. “To see how those things play out is really powerful for a park that’s a tenth of an acre or a backyard stream restoration.”

Much of this work is funded through a regional stormwater impact fee. There’s also a community cost-share program to address local issues; WRLC contributes matching funding generated by its property acquisitions, which are protected by conservation easements to reduce potential runoff in the future.

Robb wonders about the potential impact of individual rain barrels or rain gardens on an ambitious goal like capturing 98 percent of Cleveland’s total overflow. Like many who are involved in municipal projects, he also worries about ongoing maintenance costs, both on the expensive underground tunnels and on the smaller BMPs. He is concerned about future increases in stormwater fees, particularly for the older and most urban sections of the city, which have increasingly aging infrastructure. Low-income residents in these areas are bearing the consequences of upstream sprawl and runoff from the interstate system. Robb points out, “We’re not taxing these areas equitably.”



Restoration Project. Photo courtesy of the Western Reserve Land Conservancy

CASE STUDY

Building Climate Resilience in a Coastal Region



Lower Shore Land Trust (Maryland)



Climate Resilience



Collaborative Partnerships



GIS



Wildlife Habitat

The Delmarva Peninsula—its name combining Delaware, Maryland and Virginia—is at a crossroads. [Recent projections](#) of sea level rise anticipate that the ocean will be 10–14 inches higher by 2050 on the East coast. According to a [2012 Maryland Department of Natural Resources report](#), the state is losing 580 acres a year to shoreline erosion and may lose as much as 70 percent of its tidal emergent marsh systems within the next 100 years. As coastal lands are lost, uplands that are currently non-tidal will begin to experience the effects of saltwater intrusion. In some places, increasingly salty soil will make currently arable land unusable for future farming. Land experiencing new storm surges will experience increased erosion, sending huge amounts of nitrogen, phosphorus and sediment into the Chesapeake Bay.

The accredited [Lower Shore Land Trust \(LSLT\)](#), with a staff of four and an active board, is working in Somerset, Wicomico and Worcester counties, Maryland, to adapt the Delmarva region to its changing conditions. With grant funding from the Alliance’s Chesapeake Land and Water Initiative, LSLT partnered with Wicomico County planning staff and the Eastern Shore Regional GIS Cooperative at Salisbury University. The land trust needed updated, localized GIS models that could identify priority parcels that support climate resilience. Marshes are essential habitat for many threatened species—LSLT used its GIS model to predict **marsh migration corridors**, places likely to become future marsh systems, and pinpoint areas that will experience saltwater intrusion. “This tool gave us an opportunity to take ownership of our conservation priorities and be proactive,” says Executive Director Kate Patton.



Having this updated model has helped Lower Shore Land Trust to form important partnerships that are advancing land protection in pursuit of greater climate resiliency on the Delmarva Peninsula. In 2017, LSLT helped to convene a series of stakeholder meetings that resulted in establishing the [Delmarva Restoration and Conservation Network](#). The Network is organized around four principal working groups—Land Protection, Agriculture/Forestry, Towns/Urban Areas and Restoration/Adaptation—and supports interconnected work to advance both the natural areas and sustainable resource-based industries on the Delmarva Peninsula. Work through this network has attracted financial support from the National Fish and Wildlife Foundation, Land Trust Alliance’s Chesapeake Land and Water Initiative and the U.S. Endowment for Forestry and Communities’ Healthy Watersheds Consortium.

The Network is an effective vehicle for organizing the many different conservation, climate resiliency and community organizing initiatives underway on the Delmarva Peninsula. The region has long benefitted from the presence and sustained activity of the U.S. Fish and Wildlife Service, National Park Service, Maryland Rural Legacy Program and the Department of Defense’s Readiness and Environmental Protection Integration program, which protects land throughout the Nanticoke River watershed for the Naval Air Station at Patuxent River. County and municipal governments, such as the City of Salisbury, have also been actively involved in addition to the many conservation organizations, faith-based groups, and other nongovernment stakeholders. LSLT was able to bring more than 100 of these partners under the same roof at the [2018 Lower Shore Planning Conference](#) and has maintained contact with many of them through the Network.

Resources

This section identifies resources that land trusts can use to support their work to protect and restore water quality. It is not intended to be an exhaustive list—which would be constantly changing—but is included as an overview of selected programs and places to start seeking funding.

FEDERAL FUNDING OPPORTUNITIES

The [Funding Integration Tool for Source Water](#) is the most comprehensive source for information about federal drinking water programs. It guides users through the EPA's various funding sources for drinking water protection, outlines their associated requirements, offers project examples and more.

The [Water Finance Clearinghouse](#) compiles thousands of studies, guides, project examples and funding opportunities. The EPA has similar clearinghouses for financing air quality and land-based work as well.

Environmental Protection Agency Programs

EPA funding is often a part of the regional and state level opportunities presented in this guide as being administered by other entities. The EPA also sponsors grant programs directly to improve water quality.

- For nonpoint source pollution projects: [Clean Water Act Section 319 grants](#)
- For drinking water: [Drinking Water State Revolving Fund](#) and the [Clean Water State Revolving Funds program](#)

The EPA has a searchable map on regional grant opportunities: www.epa.gov/grants/regional-grants-information

“From a funding perspective, it opens the door to more opportunities for grant dollars. A lot of organizations are concerned about water quality. And making the leap is not huge.”

MIKE KELLY, The Conservation Fund (accredited)



Farm Bill Conservation Title Programs

Farm Bill funding and programming for agricultural conservation steadily increased for 60 years before experiencing sustained reductions starting in 2014. According to a [Congressional Research Service report](#), Conservation Title programs received \$6.7 billion in 2020. Most land trusts shared that their best information on Farm Bill programs came from working directly with their local Soil and Water Conservation District or ag preservation board. These entities helped them to see which programs are the best fit for the water quality needs in their regions and helped connect them to funding. The [regional](#) offices are also an important resource.

- Priority Natural Resource Concerns: [Regional Conservation Partnership Program](#)
- State level funding: NRCS administers its funds through a suite of targeted conservation programs that change over time: a 2020 overview is provided by the [Congressional Research Service Guide to Programs](#). The most popular programs for land trusts are ACEP-ALE/WRP, EQIP, CREP and CSP (see at right).

Other programs relevant to water quality include [Grassroots Source Water Protection](#) and the [Grazing Land Conservation Initiative](#). In addition, NRCS offers both technical assistance and emergency assistance through the [Emergency Conservation Program](#), [Emergency Watershed Protection Program](#) and [Emergency Forest Restoration Program](#).

Other valuable federal funding sources named by land trusts include:

- The [State Land and Water Conservation Fund](#)—administered by the National Parks Service (with the federal program funds, \$450 million in 2020)
- [North American Wetlands Conservation Act Grants Program](#) (NAWCA)—administered by the Fish and Wildlife Service (\$34 million in 2020)
- [Coastal Zone Management grants](#) and [Coastal Program grants](#)—The National Oceanic and Atmospheric Administration (\$37 million in 2020)
- [Readiness and Environmental Protection Integration](#)—Department of Defense (\$17.1 million in 2020)

In many cases, working closely with agency contacts is the best way to leverage these and other funds, particularly when federal funding is available only to state agency applicants. Partners in state offices can often help identify opportunities that would be the best fit for high-priority projects.

Adapted from Congressional Research Service, [Agricultural Conservation: A Guide to Programs](#), August 19, 2020. [Download Full Guide](#).

Programs for Working Lands	<ul style="list-style-type: none"> • Environmental Quality Incentives Program (EQIP) • Conservation Stewardship Program (CSP)
Land Retirement	<ul style="list-style-type: none"> • Conservation Reserve Program (CRP) • Conservation Reserve Enhancement Program (CREP) • Farmable Wetlands • CLEAR30 • Soil Health Income Protection Pilot
Easement	<ul style="list-style-type: none"> • Agricultural Conservation Easement Program • Healthy Forests Reserve Program
Compliance	<ul style="list-style-type: none"> • “Sodbuster”: Highly erodible land conservation • “Swampbuster”: Wetland conservation
Partnership	<ul style="list-style-type: none"> • The Regional Conservation Partnership Program (RCPP) • Conservation Innovation Grants (CIG) • Voluntary Public Access and Habitat Incentive Program

REGIONAL FUNDING SOURCES

In the Chesapeake, the National Fish and Wildlife Foundation administers the Chesapeake Bay Stewardship Fund, which supports two grant programs across all states in the watershed: the **Innovative Nutrient and Sediment Reduction Grants**, which supports large scale restoration projects and the **Small Watersheds Grants**, which supports community restoration. You can find out more at www.NFWF.org/chesapeake.

A coalition of Bay funders called the [Chesapeake Bay Funders Network](#) brings together a group of family foundations, corporate philanthropy programs and publicly funded foundations. The Network does not accept unsolicited applications but the member organizations each have their own policies and programs.

In the Great Lakes, the Great Lakes Commission administers the [Great Lakes Sediment and Nutrient Reduction Program Restoration](#) to fund implementation of the Action Plan. [The Great Lakes Funder Collaboration](#), with more than 50 funders, provides resources to projects in both the U.S. and Canada. The [Great Lakes Fishery Trust](#) provides funding for stewardship projects. The [Great Lakes Protection Fund](#) was funded through an original pledge by the governors of seven states. The [Fund for Lake Michigan](#) is largely focused on Wisconsin and the immediate shoreline. Several organizations interviewed for this guide mentioned the [Charles Stewart Mott Foundation](#), an important funder in the region.

The National Fish and Wildlife Foundation (NFWF) also provides regional funding in the Great Lakes through the [Sustain Our Great Lakes program](#), as well as the [Chi-Cal Rivers Fund](#) and the [Southeast Michigan Resilience Fund](#).

In addition, NFWF has Regional Joint Ventures, focused on migratory birds (and in the Northeast and Appalachian region, based on [Eastern Brook Trout](#)). [A directory of regional joint ventures can be found here](#). The Land Trust Alliance also has a resource that is useful for land trusts working in the Western United States: [Land Trusts and Water: Strategies and Resources for Addressing Water in Western Land Conservation](#).

MARKET-BASED AND PRIVATE SOURCES

Market-based and private resources for water quality protection and restoration are becoming increasingly significant. There is a range of possibilities for land trusts to engage in this space, just a few of which are described here. For further reading, the Conservation Finance Network has produced a [toolkit](#) describing options that go beyond what can be covered here.

Private conservation financing options seek to deliver outcomes for conservation while also earning a return on investment. Environmental Impact Bonds, in which investors are paid a premium if green infrastructure can improve public waterways above a certain threshold, has been used successfully in [Washington, D.C.](#), and is being tested in cities like Buffalo, New York and Atlanta.

Water funds are another model of funding for water projects where downstream stakeholders can reduce their costs on grey infrastructure by making direct payments for conservation upstream. In the Brandywine watershed, Brandywine Conservancy found that for every dollar invested in the headwaters of Pennsylvania, the downstream communities Wilmington and Newark, Delaware, could save \$200 in treatment costs. In the



Great Lakes, the City of Milwaukee has experimented with paying farmers directly for **not** applying fertilizer through the [Milwaukee River Pay for Performance project](#), which has also developed a [how-to guide](#). Pilot programs funded through the [Great Lakes Regional Initiative](#) are underway in the Kalamazoo River watershed in Michigan, the Maumee and Sandusky rivers (Ohio) and the Fox River in Wisconsin. The Nature Conservancy has developed [an international toolbox](#) around this concept. Many of these projects are being implemented through access to the funding sources described above.

Water quality trading is conceptually similar to transfer-of-development rights programs. They permit some geographies or polluters to exceed their authorized pollution limitations in exchange for paying for offsetting improvements elsewhere in the watershed. The EPA has issued [guidance on trading for water quality](#), and the Conservation Finance Network has published a [comprehensive overview](#) of U.S. water quality trading markets.

Wetlands mitigation banking is a commonly used, market-driven practice that, done right, can support land trust efforts to protect land and water quality. The Land Trust Alliance has produced a guidebook on this topic in partnership with the Environmental Law Institute: [Wetland and Stream Mitigation: A Handbook for Land Trusts](#) (2012). Mitigation banking for other natural resources, including canopy cover and riparian buffers, can also be used to support conservation. For example, [Anne Arundel County](#), Maryland requires developers to meet ambitious forest conservation and replanting thresholds on proposed developments. If the requirements cannot be met on site, they can opt to purchase reforestation “credits” from landowners with mitigation banks on private land.





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