



Landscape of **Agricultural-Municipal** Water Partnerships

With a Focus on the Pacific Northwest



Prepared for American Farmland Trust by Willamette Partnership

Clare McClellan, Lead Author
Kristiana Teige Witherill, Co-author

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Cover image provided by Clean Water Services

INTRODUCTION

Overview

In recent decades, agricultural-municipal water partnerships have gained prominence as community-driven, watershed-focused approaches to a diversity of water issues. However, these partnerships are as varied as the situations they seek to address, so pinpointing what defines this type of partnership has proved difficult, even with a growing literature and expertise on the topic. This report aims to summarize and identify typologies within the agricultural-municipal water partnership landscape, specifically in the Pacific Northwest, and presents pathways for moving these partnerships forward.

Who is involved?

This report is a collaboration between American Farmland Trust (AFT) and Willamette Partnership and emphasizes opportunities for organizations such as these to support development of agricultural-municipal water partnerships in Pacific Northwest communities. AFT's work in protecting agricultural land and promoting sound farming practices complements Willamette Partnership's work to pursue environmental solutions that benefit natural and human communities. These two organizations have worked together since 2013 through the National Network on Water Quality Trading, providing options and recommendations to improve consistency, innovation, and integrity in water quality trading. As a partner in the [South Sound Discovery Farms® project](#), AFT has helped farmers in King County, WA install different types of manure storage best management practices, and is currently monitoring the water quality benefits to the Newaukum Creek Basin. Funding for the Discovery Farms® project and this report came from the Environmental Protection Agency and passed through the Washington State Department of Ecology as part of the National Estuary Program (NEP).

AFT History in WQT and Environmental Markets

Over the last fifteen years, AFT has done significant work to evaluate and advance the opportunity for farmers and the agricultural community to participate in water quality trading and other environmental markets programs. The work has run the gamut from holding focus groups with agricultural stakeholders to developing publications informing stakeholders about environmental markets to being an integral partner in developing a leading water quality trading program. AFT continues to be a thought leader and significant contributor to the on-going development of environmental markets across the country.

Since 2010, AFT has contributed significantly to the evaluation and assessment of water quality trading and other environmental markets through several publications. In 2010, AFT published the *Guide to Environmental Markets for Farmers and Ranchers*. Co-written by then Pacific Northwest Director, Don Stuart, this was created to help farmers understand different ways that they could benefit from emerging environmental markets, including water quality trading. In 2015, AFT was a significant contributor to the National Network on Water Quality Trading publication, *Building a Water Quality Trading Program: Options and Considerations*. This was created to provide a set of guiding principles for any entities or organizations working to develop a water quality trading program. Finally, in 2018, AFT partnered with the National Association of Conservation Districts (NACD) to publish the *Handbook for Conservation Districts on Environmental Markets*. AFT and NACD completed case studies with ten Soil and Water Conservation Districts (SWCDs) on their experiences participating in water quality trading programs and other environmental markets programs with the purpose of educating SWCDs across the country on potential roles for districts in these programs.

AFT has also made significant contributions to the development of water quality trading programs. For example, AFT was a leading partner in the development of the Ohio River Basin Water Quality Trading program (<https://wqt.epri.com/>) led by the Electric Power Research Institute (EPRI). AFT filled a critical role in engaging the agricultural community throughout the development and implementation of the project. AFT hosted a series of focus groups with agricultural stakeholders early in the development process and led on-going engagement with the agricultural community through an agricultural advisory committee. In addition, AFT coordinated on-the-ground communication with state agricultural agencies, SWCDs, and farmers during the implementation phase of the project. The learnings from those efforts have been summarized in the Soil and Water Conservation Societies 2020 book, *Soil and Water Conservation: A Celebration of 75 Years* (Chapter 8. Protecting Ecosystems by Engaging Farmers in Water Quality Trading: Case Study from the Ohio River Basin), which was co-authored by Jessica Fox from EPRI and Brian Brandt from AFT.

How did we get here?

Given their past experience in water quality work and their strong relationships with both the agricultural community and policy agencies, AFT hopes to support collaborative water quality partnerships in Washington state. Willamette Partnership is embarking on a multi-year effort to expand agricultural-municipal water partnerships in Washington and Oregon. This report grew out of AFT's and Willamette Partnership's shared vision of making agricultural-municipal water partnerships an attainable reality for communities in the Pacific Northwest.

Defining Agricultural-Municipal Water Partnerships

Many of our waterways face high levels of nutrients, sediment, and warm water, and municipalities often face expensive choices about updating or replacing their water infrastructure. Simultaneously, farmers need support to implement more on-farm best management practices and rural communities need capacity to address these issues and compete for resources. Agricultural-municipal water partnerships connect these needs and goals by bringing together a diverse set of stakeholders in a collaborative watershed management process that results in equitable, sustainable solutions with beneficial outcomes for all partners and for the environment. When done well, these partnerships help municipal governments and utilities meet their environmental goals with lower costs and desirable co-benefits. Some of these co-benefits across sectors can include increased crop productivity and resiliency; buffered fire or flood risk; new workforce development and local jobs; and improved water quality, quantity, habitat, and recreation opportunities.

Examples of On-Farm Best Management Practices (NRCS practice code)

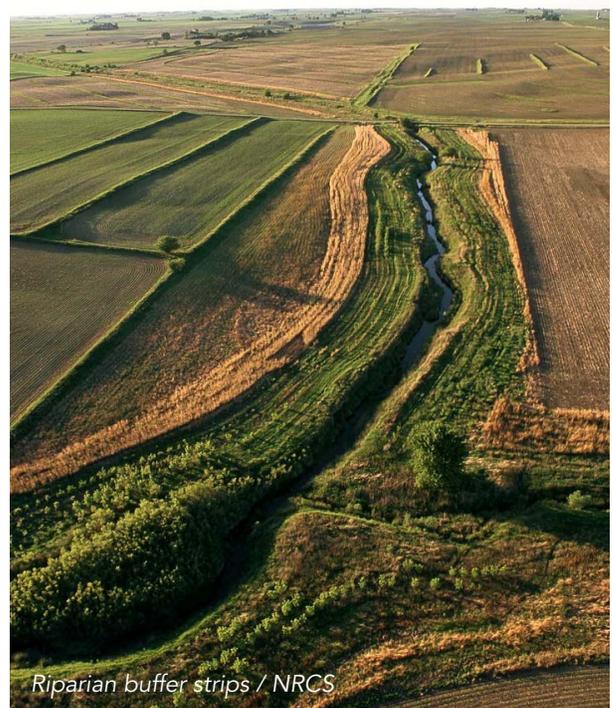
Animal waste storage (318)
Bioreactors (605)
Cover crops (340)
Deep tillage (324)
Irrigation water management (449)
Nutrient management (590)
Riparian forest buffers and herbaceous cover (391, 390)
Wetland creation, enhancement, and restoration (658, 659, 657)

Willamette Partnership

Willamette Partnership is a conservation nonprofit dedicated to using nature to solve complex problems in ways that work for people. The Partnership is known for helping state and federal natural resource agencies, businesses, and conservation interests take advantage of opportunities to achieve goals related to environmental, economic, and community resilience.

Willamette Partnership has been a proponent of water quality trading for over a decade, helping to build and explore programs and policies in Oregon, Idaho, and California. In 2013, the Partnership established the National Network on Water Quality Trading and served as network coordinator until 2019. Together with partners from the agricultural, regulatory, and practitioner sectors, Willamette Partnership and the National Network developed a suite of resources, tools, and templates that have made it faster, easier, and less expensive to implement water quality trading programs.

Willamette Partnership's water quality trading work set the stage for their new initiative, launched in 2020, to provide technical assistance to the many different types of partnerships between agricultural and municipal interests that are working to achieve water quality, reliability, and flood mitigation goals through on-farm conservation practices across Oregon and Washington.



Riparian buffer strips / NRCS

Current Challenges and Barriers

Where agricultural-municipal water partnerships exist, there has been improved water quality, habitat, and broad environmental performance of working lands. Yet, these partnerships have not scaled widely and organizations like AFT and Willamette Partnership have faced obstacles in helping develop them:

- Agricultural-municipal water partnerships can form in a vast array of different contexts, so understanding and defining them as a whole has historically been challenging.
- Due to the variety of partnerships that fall under this umbrella, there is no simple catch-all protocol that can guide partnership development, which has prevented the spread and scaling of these partnerships.
- Although practical and research-based knowledge exists on the topic, it is not yet easily accessible in one place or aimed at organizations wishing to support partnership development. For example, it is unclear what kinds of technical assistance, funding, or other tools are most helpful in different partnership scenarios.
- There is a wealth of untapped knowledge about these partnerships in people who are participating in their development and implementation on the ground.

Addressing Barriers and Challenges: Water Quality Trading

Water quality trading programs have been built across the country – from Oregon to Ohio, Connecticut to Florida, and Minnesota to California. But some of these programs have seen few, if any, actual trades. In its 2018 report *Breaking Down Barriers: Priority Actions for Advancing Water Quality Trading*, the National Network on Water Quality Trading proposed an action agenda to overcome the most common barriers to water quality trading:

1. Simplify water quality trading program design and application.
2. Ensure state regulatory agencies have adequate capacity and resources to engage on water quality trading.
3. Clarify each administration's and the U.S. Environmental Protection Agency's position on water quality trading.
4. Actively address real and perceived risks for buyers.
5. Identify and address risks of litigation.
6. Create guidance on trading for stormwater.
7. Build stakeholder relationships and trust.

Where to go from here?

Communities and ecosystems in the Pacific Northwest both need and are ready for the collaborative, holistic, and benefit-oriented approach offered by agricultural-municipal water partnerships. In response to the goals of AFT and Willamette Partnership, and in service of supporting more communities in pursuing these partnerships, this report aims to:

- Create a typology of agricultural-municipal water partnerships and explore challenges and opportunities within each type.
- Highlight the experience and wisdom of people currently or previously involved in each type of partnership through case studies and lessons learned.
- Present patterns across partnership types and strategies for moving forward, with a particular focus on opportunities for technical assistance.
- Identify potential partnership locations in Washington State.

PARTNERSHIP MODEL: WATER QUALITY TRADING

Overview

Water quality trading (WQT) programs address pollution reduction targets by allowing point sources (usually wastewater or stormwater facilities), to purchase water quality benefits as credits from nonpoint sources, (usually agricultural or other landowners). Credit-generating measures include riparian restoration, development and implementation of best management practices (BMPs) for farm and rangeland conservation, and pollution removal techniques. Most often, WQT is discussed as a tool for a source to meet its Clean Water Act (CWA) regulatory requirements by purchasing additional water quality improvements (e.g., reduced pounds of nutrient discharge) from another entity instead of, or in addition to, installing technology at its own facility. Although the CWA does not explicitly authorize WQT, the US EPA asserts that the authority to trade is implicit in the statute. Nonetheless, many states have relied upon their own authorities to approve trades. Fifteen states now have some form of statewide statute, policy, or guidance governing WQT.

There are typically three main phases of a WQT program. A scoping and planning phase, where partners discuss goals, agree on roles, secure funding, and ensure that the plan will result in regulatory compliance. A second implementation phase, where water quality improvement measures are put into action and credits begin to be certified and purchased. A third phase involves project monitoring, maintenance, and evaluation. A robust water quality trading program not only creates pathways for a point source to achieve its pollution reduction goals, but also can provide many co-benefits, including on-farm conservation through BMPs; habitat restoration; investments in the local economy through job contracts; and community partnership formation. In many ways WQT has emerged as the original type of agricultural-municipal water partnership, so a large body of work, both formal and informal, exists on the topic.

Key Players and Roles

Successful WQT programs include systems to maintain transparency around the methods they employ, ensure real and verifiable pollutant reductions, track and review projects and credits throughout their lifecycle, rely on sound science, and establish clear lines of responsibility. Achieving these goals requires the collaborative effort of a variety of partners, and although water quality trading programs vary in structure across a diversity of situations, the primary participants remain fairly consistent. Agricultural and municipal entities typically form the cornerstone of the partnership program, but many other groups can and should be involved in a successful WQT program. Key players and their roles include:

- Point sources — Municipal wastewater and stormwater facilities, industrial facilities
 - As regulated entities, they usually drive the creation of a WQT program in pursuit of an alternative way to meet permit requirements; typically provide a majority of funding and resources, navigate the regulatory process, and have a stake in ratepayer outreach and buy-in.
- Non-point sources — Agricultural and other landowners with property along water bodies
 - Lease land for restoration and maintain access to restored areas; develop and implement on-farm BMPs that achieve water quality improvement.

Win-Win-Win Scenario

When done well, water quality trading programs can provide multiple benefits for all partners and the environment:

- **Municipal benefits** — Meet water quality requirements for municipal effluent more cost-effectively, and avoid the need for installing costly technology to achieve water quality improvements.
- **Agricultural benefits** — Get support (funding, capacity) to develop and implement BMPs that conserve and enhance agricultural land, and receive payment for these on-farm conservation measures that generate water quality credits.
- **Environmental benefits** — Restore riparian areas and habitat, and mitigate the harmful effects of effluent of a lower water quality.

More information on WQT programs can be found in the National Network on Water Quality Trading's [Breaking Down Barriers: Priority Actions for Advancing Water Quality Trading](#) and the comprehensive guide [Building a Water Quality Trading Program: Options and Considerations](#).

- Regulators — State and federal
 - o Provide codified or flexible pathways for agricultural-municipal partners in WQT programs to pursue trading as an adaptive management option for permit compliance; work with partners to ensure water quality improvement requirements are met.
- Third-party management group — Non-profit, agricultural intermediaries (such as Soil and Water Conservation Districts), a subset of program partners, or governmental agency
 - o Coordinate logistics and facilitate administration of the program. Tasks could include provide funding or access to funding opportunities; identify agricultural landowner partners and build partner relationships; convene meetings; contract with local businesses for implementation, maintenance, and monitoring; track and evaluate project success; and have water quality credits certified, verified, and registered with marketplace or clearinghouse.
- Local economy — Restoration-focused businesses
 - o Support water quality improvement work through restoration, monitoring, site maintenance, or other installation jobs.
- Community members
 - o Provide public comment for the project to ensure it meets community needs and participate in education and outreach.

Funding Sources for Program Development and Operation

- Municipal facilities seeking to comply with their water quality discharge permits
- State and federal watershed, rural development, or farmland conservation-focused grants or programs (e.g. USDA Natural Resources Conservation Service cost-share programs)
- In-kind or other resources from partners
- Private impact/investment capital
- Private philanthropy or foundations

Partnership Challenges and Opportunities

Drawing on the wealth of literature on WQT programs, we can identify some of their common challenges and opportunities.

Four main challenges have been identified:

- Building trust between partners, the public, and regulatory agencies and bridging divides in geography, culture, and politics.
- Having access to regulatory pathways and capacity that codify WQT as a valid, effective option and that allow for the longer timeframe of partnership-building and ecological work.
- Lack of a lead entity willing and with capacity to champion development of a WQT partnership.
- Identifying common goals that can bring partners together, while also developing programs that acknowledge diverging incentives that may motivate each partner group.

These challenges are balanced by innovative opportunities, such as:

- Involving a third-party group, such as a subset of the partners or a non-profit organization, to coordinate program logistics and manage implementation. This solution can help keep the project on track, support relationship- and trust-building between partners, and reduce the work burden on municipalities, agricultural landowners, and regulatory agencies.
- If state regulatory pathways supporting alternative compliance approaches like WQT trading do not already exist, drafting a document such as a Memorandum of Understanding between the state permitting agency and a municipality can open the door to WQT program formation and lay the foundation for other municipalities to do the same (see Dubuque, IA and Iowa Department of Natural Resources MOU).
- Risk mitigation practices like legal groups drafting contract templates, state agencies defining a range of acceptable project trajectories that will not influence credit value, and non-profits discussing and clarifying risk perceptions with credit buyers and sellers.

EXAMPLE

To meet temperature limits for its wastewater treatment facility's discharge into the Rogue River, the City of Medford, Oregon adopted a novel plan in 2011: partner with landowners and The Freshwater Trust to restore riparian shade, quantify the solar radiation blocked by the shade, and turn those reductions into water quality credits. What developed is a water quality trading program that fulfills the wastewater facility's temperature requirements, restores habitat, and provides local jobs in the green economy. In addition to this broad spread of benefits, the water quality trading program solution was projected to cost about \$6.5 million, a significant cost-reduction for the City and its ratepayers when compared to the other engineered solutions that were considered.

Over the lifespan of the project, the partners aim to restore 100 acres of the river's riparian area with native trees and plants, ultimately offsetting 600 million kilocalories per day of temperature impact on the river. Landowners are paid a yearly rent over a 20-year lease and are responsible for ensuring access to the restored area to allow maintenance and monitoring. After a third party — which in this case happens to be Willamette Partnership — verifies a restored area's credit generating capacity, the City of Medford can purchase the credits and meet their Clean Water Act water temperature limits. To account for the longer timeline of restoration work and to ensure the project mitigates the wastewater plant's impact, trading is done in a 2:1 ratio.

For many locations interested in WQT, regulatory hurdles make designing a program like this one a longer process. In Medford's case, WQT was already written into its discharge permit as an option for meeting temperature requirements, and the project could gain immediate traction when it was approved by the partners. Another aspect of this project's success comes from The Freshwater Trust's coordination of logistics — from identifying landowners to contracting with local businesses for restoration and monitoring work — which streamlined the process for the City and landowners.

Citations:

<https://www.thefreshwatertrust.org/case-study/medford-water-quality-trading-program/>
<https://oeconline.org/the-cooling-power-of-trees/>

Lessons Learned

Water quality trading programs rely on having municipal and agricultural leaders who are willing to champion the partnership, since these projects often encounter regulatory delays or hurdles. Additionally, a non-profit or other third-party group can take on a coordinating role for the program and ease burdens on the partners, but this group needs to let local partners lead the goals and process. The success of a WQT program largely rests on the foundation of trust between partners, as well upon its ability to not only help partners meet compliance requirements, but also achieve real watershed health improvements.

Given a challenging regulatory environment, there is some possibility for programs similar to WQT to evolve outside the official permitting realm, as with the Yahara Watershed Improvement Network example in Wisconsin. Agreements such as memoranda of understanding can provide an interim solution for program structure until regulatory channels exist, as with the City of Dubuque example. Finally, it is important that WQT programs not be conceived of as the only solution to watershed pollution problems. Rather, these programs can be successful as parts of a broader plan that also includes shorter-term solutions to address immediate environmental justice concerns.

Other WQT examples

- [Medford Water Quality Trading Program, Medford, OR](#)
- [NEW Water Silver Creek Project, Green Bay, WI](#)
- [Great Miami River Watershed Water Quality Credit Trading Program, Southwest Ohio](#)
- [Clean Water Services Tree for All Water Quality Trading Initiative, Hillsboro, OR](#)
- [City of Dubuque and Iowa DNR Memorandum of Understanding for WQT, Dubuque, IA](#)

Adaptive Management program in Wisconsin (similar to WQT)

- [Yahara Watershed Improvement Network, Dane County, WI](#)



Liquid manure spreader for nutrient management

“Having the right leadership identified on both sides, on the utility side and on the agricultural side, is another huge way that a third-party entity could jumpstart these kinds of partnerships”

— Scott Berry, US Water Alliance

PARTNERSHIP MODEL: FLOOD MANAGEMENT

Overview

Flooding is a widespread issue for communities across the Pacific Northwest in a variety of environmental settings. Typically, floods affect some groups within a community more than others, with these effects often traveling along lines of existing vulnerability or inequity. However, it is also typical that a wide range of stakeholders are motivated to seek flooding solutions, making flood management an ideal candidate for agricultural-municipal water partnerships. Within the scope of flood management partnerships, two primary pathways emerge: A partnership might form around flooding as its central concern, or a partnership might include flood management as one of a suite of water improvement goals. Both types of partnerships usually involve the funded implementation of BMPs that slow down or capture runoff before it enters flood-prone waterways, and can also include natural floodplain restoration on private or government-owned property. A partnership that centers flood management might also involve the removal of flood control “gray infrastructure” (e.g. levees), and in some cases might call for construction of better-designed or -positioned gray infrastructure.

Win-Win-Win Scenario

When done well, flood management programs can provide multiple benefits for all partners and the environment:

- **Municipal benefits** — Mitigate negative flood impacts on infrastructure and the community, and potentially create more public recreation or nature education opportunities.
- **Agricultural benefits** — Address flood impacts on agricultural land, such as erosion, inundation, or debris deposition, and may involve payment for land easements for floodplain restoration.
- **Environmental benefits** — Restore critical floodplain and riparian habitat, and may also include removal of some gray infrastructure, such as levees, which restores natural water movement.

In either scenario, flood management partnerships are often community-driven, due to the public perception of flooding as an immediate and tangible issue, and almost always involve local, state, and sometimes federal government agencies; agricultural landowners; conservation organizations; and community groups. Regulatory support for flood management partnerships is strong, as most levels of government in affected locations have identified flooding as a critical issue and already have dedicated flood mitigation funding pathways, regulatory frameworks, and personnel. The flip side is that agricultural-municipal flood management partnerships working within this robust regulatory environment might find the process complex and time-consuming. However, a successful flood management partnership harnesses the regulatory support in service of the community’s unique goals and process around flood mitigation and ecosystem improvement.

Key Players and Roles

The common goal of all flood management agricultural-municipal partnerships is increased flood control, whether the partnership’s primary focus is flooding or flood management as one goal of a broader water quality improvement project. Because flooding often affects such a wide swath of stakeholders in a community, a successful partnership brings all of these voices to the table from the beginning of a flood management project. Maintaining consistent, transparent communication throughout the process and creating a partnership atmosphere of trust and collaboration might take time but are critical for a flood management partnership that works. While it is often a local government that kickstarts the partnership formation, a wide range of key players who take on different aspects of the project is necessary, including:

- Federal government agencies — FEMA, US Forest Service, USFWS, USDA NRCS
 - o Provide funding through various programs directed at specific elements of a flood management partnership; for example, through programs for emergency assistance, fish habitat improvement, or watershed-wide water quality improvement. Also provide regulatory pathways for permitting flood management plans, and in some cases lease or transfer federally-owned land within a partnership’s project area for management.

- State government — State permitting agencies, members of state legislature
 - Similar to federal government agencies, fund flood management partnerships through existing or newly generated flood-related budgets; focus public and legislative attention on flood management conversations; and work with partners to permit flood management actions.
- Local government — County, city, or other municipal government, municipal clean water services department, Flood Improvement Districts
 - Convene stakeholders and guide project goals and tasks, may lead partnership meetings; contribute owned land parcels to project; participate or lead on funding acquisition and budget management; work with landowners to acquire or manage land parcels for restoration or floodplain functions; interface with community members and the public for outreach and engagement; may contract out parts of the project implementation and monitoring.
- Agricultural landowners — With property in or near the floodplain restoration zone
 - Create and implement on-farm BMPs that increase control of flood waters; lease or provide access to property for floodplain restoration; participate in and/or guide project development.
- Conservation organizations — Non-profits, other groups involved in restoration
 - Advocate for wildlife and habitat health in project development; present science and data to inform the project; outreach around conservation messaging; may be in charge of monitoring and data collection throughout the project.
- Public — Citizens, businesses, local industry
 - Provide public comment for the project to ensure it meets community flood mitigation needs; spread support for and information about the project throughout the community; potentially provide some funding for small aspects of the project.



*Flooding of agricultural land in Tillamook County /
John Bauer*

Funding Sources for Program Development and Operation:

- Federal agency programs for emergency management (FEMA, others), or that support work for habitat or waterway improvement and land conservation (USFWS, NOAA, USDA Regional Conservation Partnership Program)
- State agencies focused on watersheds, community resilience, or land conservation
- Local government bodies or agencies tasked with flood mitigation
- In-kind or other resources from partners
- Private philanthropy and foundations

Partnership Challenges and Opportunities:

Although flood management partnerships take many forms, there are some common challenges and opportunities.

These challenges emerge as a pattern among partnerships:

- Building trust and strong relationships, which foster strong collaboration, among a diversity of stakeholders. Although partners may agree on the general goals of the project, there will likely be disagreement across groups about how best to achieve these goals.

- Consistent, transparent communication and engagement with all sectors of the partnership and the public are essential to an effective partnership. In general, existing flood management partnerships recognize the importance of communication and have incorporated it thoughtfully into their functioning; however, this could become a stumbling block for future partnerships if not carefully considered.
- Ensuring that the community and local entities are guiding and driving the flood management project, rather than outside groups.
- Partnerships may need to navigate timeline delays or additional funding needs that arise, in particular around construction for restoration or gray infrastructure modification.

These partnerships are also primed to take advantage of distinct opportunities, such as:

- Community buy-in for flood management partnerships is often strong since flooding takes such a tangible toll on people and businesses. These partnerships are thus uniquely poised to be locally-driven and involve robust public engagement and equity.
- Flood management is often able to be linked to other agricultural-municipal partnership goals, like nutrient reduction or source water protection, and a broader range of stakeholders may be able to rally behind partnerships that achieve multiple water improvement benefits.
- Due to this larger coalition of partners who might support a flood management agricultural-municipal partnership, the options for funding might also expand. For example, both emergency management and habitat restoration grants could be leveraged for a flood management plan.

EXAMPLE

In coastal Tillamook, OR, the Southern Flow Corridor (SFC) project is the product of almost two decades of community-driven collaboration, has resulted in measurable flood height and duration reductions, and has so far restored 443 acres of tidal wetlands. In 2007, after a damaging flood, the Oregon governor designated the flood mitigation efforts in the Tillamook Bay as an “Oregon Solutions” project, which created a structure and process that brought together area partners to address a politically and technically challenging community need. These partners included City and County organizations, dairy farmers and landowners, businesses, and conservation-focused organizations. A project management team representing this range of stakeholders led the effort, which has

drawn its \$11 million of funding from a variety of sources, such as a FEMA Alternate Projects grant, state monies, a NOAA grant, grants from OWEB, and a USFWS National Fish Passage program award.

The SFC partners purchased land and easements from private landowners in order to remove or modify nearly 10 miles of levees and build 1.5 miles of new setback levees, allowing tidal waters to return and re-create the natural floodplain and valuable estuarine habitat. According to project leadership, the SFC’s success largely rests on the community’s network of strong relationships, a transparent and locally-driven process, and consistent public engagement, all of which set the stage for collaboration across diverging priorities. Although involving diverse perspectives ultimately made the project successful where an earlier restoration-focused project had failed, it also took time to build the strong, trusting relationships at the project’s foundation and to thoroughly communicate and engage with all partners and the public.

Citations:

<https://www.fema.gov/node/454754>

<https://tillamookoregonsolutions.com/resources-4/>

Other flood management examples

- [Southern Flow Corridor Project, Tillamook County, OR](#)
- [Central Valley Flood Protection Plan, Central Valley, CA](#)
- [Middle Cedar Partnership Project, Cedar Rapids, IA](#)
- [Milwaukee River Watershed Conservation Partnership, Milwaukee River, WI](#)

Lessons Learned

Flood management partnerships often rely on a solid foundation of interpersonal relationships and trust among partners even more than other types of partnerships because of the many different impacts flooding has on a community. This dynamic can be a strength of the partnership, as a diversity of stakeholders will likely feel authentically driven to collaborate for a solution, but it can also be a hurdle if a partnership does not already have those strong relationships to lean on. Ensuring that all stakeholders are at the table and able to contribute to the planning process from the beginning is one method partnerships have used to create that foundation of trust. In a similar vein, maintaining good relationships with permitting and funding agencies throughout the process can set a partnership up to more easily adapt to mid-project challenges.

In terms of BMP implementation, partnerships have found that cover crops, saturated buffers, wetland creation, and wetland easements can achieve both nutrient and flood management goals. Finally, thorough post-project monitoring and the communication of those results is critical to keep the community and partners informed of the project's flood mitigation success.

“For a successful partnership, reach out to the people who might present the strongest “roadblocks” to what [you] want to do. Talk to your staunchest opponent, and ask ‘Well OK, how would you deal with it? What can we compromise on?’”

— Aaron Palter; Port of Tillamook Bay; Southern Flow Corridor Co-Project Manager

PARTNERSHIP MODEL: WATER REUSE

Overview

Water reuse agricultural-municipal partnerships typically divert treated wastewater effluent to irrigate nearby farmland (irrigable crop varieties are determined by the quality of the treated effluent). These partnerships have largely been piloted in water-scarce regions and have proved to be both economically and environmentally advantageous. Usually driven and funded by a municipal water treatment facility's need to meet nutrient or temperature discharge requirements, water reuse projects rely on the involvement of individual farmers or an organization representing area growers, such as an Irrigation District. From an agricultural perspective, motivating factors to participate include irrigation water shortages or a high cost of irrigation, which would be partially remedied by a recycled water project. Regulatory agencies must also be part of the process to ensure that the recycled water proposal will allow the treatment facility to meet its permit requirements and will protect the health of the waterway and surrounding environment. If the project impacts a waterway it must also involve other groups impacted by the proposal, including tribal governments and community organizations.

Depending on the regulatory context and environmental setting of the project area, water reuse partnerships might adopt different methods for transferring treated effluent to irrigators. For example, a water treatment facility could pipe the treated water overland or underground directly to individual farming plots, or could pipe the water into a local, communal irrigation canal. An additional aspect of some recycled water projects is the creation of water retention ponds or percolation fields coupled with reclamation wells which both function to store the full amount of water discharged to meet more of the irrigation need.

Recycled water is divided into classes based on its level of treatment and acceptable uses, and water reuse partnerships have formed using varying classes of treated water to irrigate corresponding types of fields: some non-food crops including alfalfa and silage corn, and some crops suitable for human consumption including even organic produce. A successful water reuse partnership can improve water health of sensitive areas by rerouting effluent; can allow municipal water treatment facilities to meet both discharge permit requirements and customer need; and can provide an economically efficient source of safe water for irrigators.

Key Players and Roles

Water reuse partnerships are somewhat self-contained in that they are primarily developed from collaboration between the municipal water treatment facility and nearby irrigators. However, these partners must also work closely with regulating agencies of various levels of government, and successful projects also engage other stakeholders and the public to ensure that the project serves the environment, the local economy, and the community. Partners typically include:

- Municipal water treatment facilities — Wastewater and stormwater treatment services
 - o Drive project funding, development, and implementation in order to address water quality discharge requirements; treat wastewater to agreed-upon water quality level and transfer it to irrigators, monitor effluent quality and communicate to agricultural partners.

Win-Win-Win Scenario

When done well, water reuse programs can provide multiple benefits for all partners and the environment:

- **Municipal benefits** — Meet water quality requirements, often in a more cost-effective way, by rerouting treated effluent away from receiving waterways and into irrigation canals, pipes, or back into aquifers.
- **Agricultural benefits** — Augment irrigation water supplies with high-quality treated water, often with little or no cost associated.
- **Environmental benefits** — Protect the health and habitat of sensitive receiving waterways by rerouting treated effluent that may not meet the water quality requirements.

- Irrigators — Individual growers or an organization representing area farmers, like an irrigation district
 - Support project development and opt-in to the partnership; provide information about irrigation water quantity and quality needs to inform the project, and obtain confirmation from crop quality regulators if necessary, such as confirming that Class A recycled water meets organic produce requirements; grow appropriate crops for the recycled water's treatment level and that address any water quality concerns, for example growing nitrogen-removing crops to address nitrogen overloads in soils.
- Regulators — State, federal, and/or tribal
 - Work with municipal and irrigator partners to develop permitting pathways that make recycled water partnerships viable; ensure that projects allow municipal treatment facilities to meet their water quality requirements and that projects protect watershed health; in some cases re-evaluate the designated uses of a water body, such as an open irrigation canal, to allow the introduction of recycled water; engage the public through the permitting process.
- Data collection or monitoring entities — State Departments of Fish and Wildlife, National Marine Fisheries Service (NOAA), municipal water quality departments, etc.
 - Conduct and sometimes fund pre-implementation environmental assessments to confirm the beneficial nature of the water reuse project and ensure environmental harm is mitigated; occasionally conduct follow-up monitoring.
- Public — Citizens or community groups
 - Provide comment on and support for water reuse projects; advocate for specific community interests relevant to the project during its development.

Funding Sources for Program Development and Operation

- Municipal water treatment facility funds or acquired loans allocated for facility upgrades or compliance measures
- Irrigation districts or other groups representing irrigators
- Data collection or monitoring grants or funding from federal agencies (such as the National Marine Fisheries Service) or from state agencies (Departments of Fish and Wildlife, etc.)
- In-kind or other resources from partners
- Private philanthropy and foundations



Recycled water injection well / San Francisco Estuary Partnership

EXAMPLE

The City of Hermiston, Oregon and the nearby West Extension Irrigation District are almost 15 years into a partnership that allows the city's Recycled Water Facility to discharge Class A treated water into the irrigation district's canal to augment the summer water available to irrigators

in the water-short district. The water reuse project was the first of its kind in Oregon and was largely championed by a consulting engineer for Hermiston's Recycled Water Facility who was tasked with finding an alternative way for the facility to continue operating while meeting their waste load allocation under the 2004 temperature TMDL for the Umatilla River. Installing mechanical chillers would have mitigated the last fraction of the plant effluent's temperature impacts on the Umatilla River, but were prohibitively expensive, and did not provide added benefits for the community.

This project ultimately achieved mutually beneficial results for both the city and the irrigation district, but some challenges arose because the irrigation canal is owned by the Bureau of Reclamation and also had fish-bearing stream water quality requirements, even though the canal was dry during some summer months. Partners worked with the Bureau to design a regulatory pathway that allowed recycled water to be commingled with other irrigation water, and worked with the Oregon Department of Environmental Quality (DEQ) to complete a Use Attainability Assessment that re-designated the canal with less stringent water quality standards and permitted the recycled water project.

Hermiston's Recycled Water Facility was not able to meet increased treatment capacity needs or the new temperature requirements by the late 2000's, so the funding allocated to the planned facility upgrade largely drove the development and implementation of this project, including construction of a \$27 million membrane bioreactor treatment system to produce Class A recycled water. While irrigation district members were on board from the start, the city's commitment to providing high quality treated water built credibility for the project and trust among the partners.

Another aspect of the project's success was the city's consulting engineer, who rallied stakeholder support and championed the complex regulatory approval processes, in spite of many obstacles. The project engaged in thorough environmental reviews by working with the National Marine Fisheries Service, Oregon DEQ, and the Oregon Department of Fish and Wildlife. Input and support from the Confederated Tribes of the Umatilla Indian Reservation, Oregon Tilth, and the Oregon Farm Bureau were also crucial elements of the project's success. Hermiston's recycled water has been irrigating growers' fields for almost 4 years now, and according to all partners the project has been a "win-win" and a solution that "just makes sense" in a region where water resources are so precious.

Citations:

<https://elgl.org/wateryouwaitingfor-city-of-hermiston-oregon/>

<https://westextension.com/wp-content/uploads/2016/09/Recycled-Water-Info-June-2016.pdf>

Other water reuse examples

- [Hermiston Water Reuse Project, Hermiston, OR](#)
- [Fresno-Clovis Regional Wastewater Reclamation Facility, Fresno, CA](#)

Partnership Challenges and Opportunities

While the examples of water reuse partnerships that do exist have overall seen great success, there are a few significant challenges and considerations:

- In general, regulation and permitting agencies have historically seen their role in preserving the safe irrigation of crops and the regulation of discharged water as incompatible with a recycled water project, so there is often hesitancy to approve recycled water projects. Because few regulatory pathways exist to permit these projects, partnerships may need to work with regulatory agencies to create water reuse processes and templates, which can extend the timeframe of the project.

- A lack of case studies and accurate, accessible data on recycled water and its suitability for irrigation may cause regulatory agencies, the public, and/or other stakeholders to initially oppose the proposal.
- The types of crops that can be irrigated by treated effluent are determined by the level of water treatment attained, and treatment facilities may find that infrastructure updates necessary to achieve high quality recycled water are expensive or not efficient for their situation. Relatedly, the area's climate dictates the types of crops that can be grown, so there must be a match between the level of treated water available and irrigators who can use that water on appropriate crops.
- In some cases, effluent streams make up the majority of the water in a waterway during the summer months, so rerouting effluent for reuse in irrigation could have negative water quantity effects on the receiving waterway.

These projects also contain unique opportunities for success and collaboration, such as:

- Water reuse partnerships typically make clear business sense to both agricultural and municipal partners, so there is often less of a need to make the argument that they are win-win solutions, as partners are already supportive. The broader community is also often supportive and proud of these projects because their local benefits are usually easy to see.
- Successful projects make communities more sustainable and resilient by decreasing irrigation water demands on outside sources, and in some cases also by ultimately decreasing treatment facility costs by allowing for less intensive water quality treatment measures.
- In Oregon, regulatory pathways and templates to permit recycled water projects are in development, which will speed up and smooth the process for future partnerships. Other states may soon follow suit.

Lessons Learned

Without a technical pathway to permitting, water reuse projects are not able to get off the ground. If the regulatory hurdle can be cleared, successful water reuse projects are built upon good working and interpersonal relationships between partners. It is key to design these projects to allow municipal treatment plants to continue meeting both customer demand and their regulatory requirements years into the future, and to emphasize the ecosystem- and community-wide benefits water reuse projects can have. Because these projects are often driven by the municipal treatment facilities themselves, having a champion for the project from within the treatment facility staff can help ensure that the project navigates barriers and delays. Given the challenges water reuse projects often face, they also offer some unique opportunities for outside organizations to get involved with technical assistance. A third-party organization could facilitate and convene project meetings and activities, but would need to be sure to let local partners drive the project trajectory. In order to fill in the data and information gap about recycled water and water reuse projects, outside organizations could produce and disseminate research reports, webinars, or policy briefs aimed at different audiences (regulators and legislators, municipalities, irrigators, the public).

“[The amount of recycled water the irrigation district receives] is a small amount of water for an irrigation district, but it’s important because every drop of water is important.”

— Bev Bridgewater, West Extension Irrigation District manager, Irrigon, OR

PARTNERSHIP MODEL: GROUNDWATER PROTECTION

Overview

Groundwater protection agricultural-municipal partnerships generally fit into a few main categories, with pros and cons to each. A partnership will usually address either groundwater quantity or quality issues, though occasionally both. In many regions of the country, nitrate contamination is the most prominent groundwater quality issue. Groundwater quality and quantity partnerships look different in terms of who is involved, what funding sources are available, what data is needed, and what kinds of management decisions will be made. Partnerships also typically fall into either a State-driven or locally-driven category, which also helps determine who is involved and available funding, and additionally influences the format of the decision-making and project design processes. Regardless of which categories a partnership falls into, the key partners involved are municipal drinking water utilities, individual farmers or agricultural associations, and state permitting and natural resource agencies, as well as a varying cast of other important groups. Another commonality amongst all types of these partnerships is their foundation on sound groundwater science and a strong basis of trust between partners.

To achieve improved groundwater quantity management, a partnership might repair gray infrastructure, restore areas to allow for better infiltration and retention, and implement on-farm best management practices that enhance high quality water recharge. To address groundwater quality issues, a partnership might implement on-farm best management practices that decrease or contain fertilizer usage, incentivize farmers to plant crops that depend less on the nutrient of concern (usually nitrogen), restore areas to capture sediment and filter nutrients, and encourage frequent well-monitoring. Gaining regulatory support for a groundwater project usually is not where partnerships may falter; rather, the massive need for data and modeling, which have significant costs in both time and money, is typically what delays these types of partnerships. However, a successful groundwater agricultural-municipal partnership can enhance an area's groundwater protection and holistic watershed health through collaboration.

Key Players and Roles

In regions that rely on groundwater for most water uses, these partnerships can and should involve a diversity of voices in order to achieve equitable, sustainable solutions. These groups can include:

- Municipalities — Drinking water utilities
 - o May drive creation of the partnership if dealing with groundwater quantity or quality issues in municipal drinking water wells. Contribute funding and staffing resources, monitor and report water quality of municipal wells, and may also enter into agreements with individual farmers that incentivize crop practices that improve groundwater protection.
- Agriculture — Farmers, growers, irrigators, and grower associations
 - o Collaboratively develop and implement on-farm best management practices to improve groundwater protection. May fund project implementation and research
- State permitting agencies -- DEQ, DNR, or DoE
 - o Conduct groundwater quality and quantity monitoring and contribute data or modeling. Provide technical assistance and consulting on groundwater management decisions.

Win-Win-Win Scenario

When done well, groundwater protection programs can provide multiple benefits for all partners and the environment:

- **Municipal benefits** — Protect and/or recharge groundwater aquifers that provide municipal water to address water quantity and quality concerns.
- **Agricultural benefits** — Get support to develop and implement BMPs that conserve and enhance agricultural land and also protect groundwater quantity or quality; if area agriculture relies on groundwater, may also benefit from stabilizing this water source.
- **Environmental benefits** — Restore natural water movements within the watershed, allowing for aquifer recharge; restore riparian habitats that filter and detain water as it recharges.

- Non-profits — Conservation-focused
 - Provide technical assistance or landscape-specific expertise to partners. May take on facilitating role for the partnership and connect the project with grant opportunities.
- University extension offices
 - Staff and partially fund groundwater data collection and modeling. May also leverage relationship with agricultural community to conduct outreach and gain stakeholder buy-in and voices. May contribute agronomic knowledge to development of best management practices.
- Citizens — Private well users
 - Advocate for inclusion of private well user needs in groundwater management.
- Other potential players
 - Environmental advocacy groups: Contribute environmental perspective and information.
 - Environmental consulting or engineering firms: May be responsible for designing and implementing restoration aspects of a groundwater management plan.
 - Local businesses and economic players: Depending on the industry, may have a stake in groundwater pollution and management, and may provide some funding.
 - State or local agencies like Departments of Agriculture, Soil and Water Conservation Districts, Watershed Councils, etc.: Support partnership activities with funding, technical assistance, and with access to constituent networks.

Funding Sources for Program Development and Operation

- Municipal drinking water utility budgets
- Contributions from individual growers or grower organizations
- State agency grants: Water Resources Departments, Departments of Natural Resources, state legislature monies
- State Department of Agriculture fertilizer research funds
- State-administered (usually DEQ) 319 non-point source implementation grants
- University extension offices
- NRCS RCPP grants
- USFWS Partners for Fish and Wildlife program
- Local industry contributions
- In-kind or other resources from partners
- Private philanthropy and foundations

Challenges and Opportunities

More than some of the other types of agricultural-municipal partnerships, groundwater protection partnerships often play out in historically contentious atmospheres. A partnership approach can therefore provide both unique challenges and opportunities. From the examples of groundwater protection partnerships that inform this report, common challenges include:

- Bringing all relevant groups to the table and engaging in fruitful, trust-based communication that leads to effective management decisions may be a struggle because the stakeholders implicated in a groundwater protection plan can be so numerous and represent such varied, and sometimes conflicting, needs.
- Groundwater data and models are often difficult and expensive to develop, but good science is crucial to a partnership's ability to make high impact, accurate, and fair management and funding decisions.
- Because of the need for research and such wide stakeholder engagement, these projects often take place within long timeframes and may be slower-moving than others.
- Without sustainable and significant funding sources that can jumpstart research efforts, these partnerships may be delayed in moving towards an implementation phase.
- Partnerships operating within state-funded initiatives or frameworks may have to overcome long-standing mistrust between partners, especially between agricultural communities and state regulating or other governmental agencies.

If these challenges are addressed, groundwater protection partnerships can incorporate innovative opportunities:

- Because groundwater is often a controversial issue, efforts to address it can become burdened by finger-pointing. By centering collaboration and letting local stakeholders lead, agricultural-municipal groundwater protection partnerships have the chance to achieve real success in groundwater quality and/or quantity improvement as well as improve overall watershed and community health.
- Although they can present challenges, state initiatives (i.e. Oregon Water Resources Department's Place-Based Integrated Water Resources Planning) can function to bring stakeholders together to start a groundwater protection conversation, as long as area partners have some ability to drive the project's process and goals.
- Projects with fewer partners or a smaller geographic area may strongly benefit from the involvement of a third-party group, such as a non-profit, in a facilitator role. This group could also provide partnership templates or success stories to prospective partners, help navigate funding opportunities, and provide technical assistance on restoration or best management practices.
- Groundwater partnerships are particularly well-positioned to engage with academic institutions, non-profits, and state or tribal governmental monitoring agencies and could be hugely benefited by partnering on groundwater data collection and modeling.

EXAMPLES

To better reflect the variety of goals and structures within groundwater protection partnerships, two case studies are highlighted. The first is a smaller-scale groundwater quantity partnership, the Little Plover River Watershed Enhancement Project (LPRWEP) in central Wisconsin, which seeks to return groundwater baseflows to the Little Plover River, improve overall aquatic health and public recreation access on the river, and increase groundwater recharge across the watershed. After much tension among local stakeholders when the Little Plover River ran dry during a few summers in the early 2000s, the Village of Plover convened the partners that would become the LPRWEP, including: the Wisconsin Potato and Vegetable Growers Association, the Wisconsin Department of Natural Resources, the Portage County Land Conservation Department, the Wisconsin Wetlands Association, and a hydrologic engineering consulting firm.

These collaborators developed a holistic approach to understand and address the complex water management issues facing the area and have begun implementing a variety of water conservation and hydrologic restoration measures. These include wetland and floodplain restoration, on-farm best management practices, identification and repair of leaky infrastructure, reducing groundwater withdrawals, and education across the watershed. Funding comes from all of the partners, an RCPP grant, state legislative monies, state river restoration and wetland mitigation grants, an EPA Wetland Program Development grant, and a USFWS Partners for Fish and Wildlife grant. The locally-driven process and goals, partner commitment to real collaboration on a shared problem, and project facilitation by the Wisconsin Wetland Association should be highlighted as cornerstones of the partnership's success.

The second case study is the Lower Umatilla Basin Groundwater Management Area Committee, which originated as a larger-scale groundwater quality partnership in Eastern Oregon. Public water systems,

Other groundwater protection examples

- [Little Plover River Watershed Enhancement Project, Village of Plover, WI](#)
- [Lower Umatilla Basin Groundwater Management Area Committee, Umatilla Basin, OR](#)
- [Waupaca Cropping Agreement, Waupaca, WI](#)
- [Southern Willamette Valley Groundwater Management Area, Willamette Valley, OR](#)
- [Harney County Community-Based Water Planning effort, Harney County, OR](#)
- [City of Walla Walla Water Reclamation Plant, Walla Walla, WA](#)

Oregon state entities, agricultural irrigators, Confined Animal Feeding Operations (CAFOs), food processing facilities, Oregon State University Extension services, and other local stakeholders came together to form the Committee in the early 1990s in response to the detection of groundwater nitrogen levels that exceeded state limits in both public and private wells.

Since then the Committee has looked for ways to fund research on the basin's groundwater, topographical, and nitrogen hydrologic pathways, and has simultaneously collaborated on two local action plans that detail voluntary water quality improvement actions for each partner group. Agricultural growers have stepped up to fund some of the research needs and partners have overall been enthusiastic to collaborate, but a lack of project funds, the sheer number of partners who participate in decision-making, and the large geographical region make measurable progress a slower process. In this case the agricultural and municipal partners are part of a larger contingency of stakeholders who came together within a State framework for addressing groundwater protection, and these aspects of the partnership explain some of its challenges and strengths.

Citations:

<https://www.wisconsinwetlands.org/updates/what-is-lprwep/>

<https://lbgwma.org/>

<https://www.uwsp.edu/cnr-ap/clue/Documents/groundwater/casestudies/Waupacacroppingagreement.pdf>

Lessons Learned

Regardless of the groundwater issue of concern or structure of the project, it is clear that a partnership led by the local partners, and that specifically makes room for agricultural perspectives, will find more success than a partnership driven by purely regulatory factors. Similarly, making the goal of the partnership a hydrology-focused approach to whole watershed management can bring in more funding opportunities, a diversity of partners and expertise, and can provide not only groundwater protection but also a variety of co-benefits. Developing these partnerships is rarely quick and easy, but as many experienced partners pointed out, "they're worth it" because they can achieve more effective and better solutions than any one group could on its own. Finally, the need for good science and groundwater research funding cannot be overstated as a limiting factor in these partnerships' ability to succeed.



Groundwater monitoring / CC0 Public Domain

"Water flows downhill...that's why upstream practices can help address downstream problems."

— Erin O'Brien, Policy Programs Director for the Wisconsin Wetlands Association

PARTNERSHIP MODEL: SOURCE WATER PROTECTION

Overview

In a typical source water protection (SWP) partnership, a municipal drinking water entity partners with upstream agricultural and other private landowners and public land managers (e.g. United States Forest Service) to plan, fund, and implement conservation practices or restoration activities that will improve or protect the drinking water source area in the watershed. Achieving watershed-wide health improvements, supporting farmers to continue their operations

and adopt more on-farm conservation practices, and broad community engagement with water quality work are three additional goals of a typical SWP partnership. Drinking water protection is the realm of many federal, state, and local government agencies, and because they are often successful, less expensive than water treatment plants, and provide many co-benefits, SWP programs have become more commonplace in these regulatory frameworks. For example, the US EPA's Safe Drinking Water Act lists watershed source water protection as an alternative to installing filtration mechanisms at a treatment facility. While most SWP partnerships evolve because they are identified as the most cost effective and holistically beneficial way to address pollution problems in a drinking water source area, some evolve with an element of preemptive protection of intact riparian buffers in the watershed. However the SWP project is configured, it usually includes a municipal drinking water entity, agricultural landowners as individuals or as represented by a group, local watershed or soil and water organizations, and funding agencies. Given the widespread regulatory and governmental support for SWP programs, a SWP agricultural-municipal partnership's role is to bring stakeholders to the table and create a collaborative, mutually beneficial program that leverages diverse funding avenues and partner expertise in service of collective goals for water quality and watershed health.

Key Players and Roles

Source water protection partnerships are a watershed-wide approach to improving drinking water quality, ecosystem health, and farmland productivity, so they often bring together a wide range of stakeholders, including:

- **Municipal drinking water utilities** — Public water supply systems
 - Identify source water protection geographic area, and sometimes convene and coordinate relevant partners; define water quality goals for the project, provide personnel capacity, and potentially channel built-in source water protection funds towards the project; provide funding for voluntary conservation programs.
- **Local watershed or soil and water organizations** — Watershed Councils or Soil and Water Conservation Districts
 - Act as bridge between agricultural landowners and drinking water utility or other project implementers; allocate staff to project work, engage in outreach and education with agricultural community and landowners; work with federal entities like the Natural Resource Conservation Service to leverage federal funding for the project.
- **Agricultural landowners** — Individual upstream farmers
 - With support and funding, voluntarily plan and implement on-farm best management practices to prevent or decrease pollution or other water degradation; may also lease riparian property or enter into an agreement that protects or restores that land; other private

Win-Win-Win Scenario

When done well, source water protection programs can provide multiple benefits for all partners and the environment:

- **Municipal benefits** — Achieve drinking water improvement and protection goals and avoid costly infrastructure installation, instead investing those funds in restoration that positively impacts overall watershed health.
- **Agricultural benefits** — Get support to develop and implement BMPs that conserve and enhance agricultural land and also mitigate water quality impacts; receive payment and support for implementation of these conservation practices.
- **Environmental benefits** — Restore riparian habitat and improve water quality.



Trees planted along a tributary of the McKenzie River expand riparian buffer to protect the river from agricultural runoff / Upper Willamette Soil and Water Conservation District

landowners may also be included in the project if they have riparian property; provide opportunities for projects that include carbon credits in addition to water quality credits, potentially expanding the buyer's market.

- Private corporations and large water users — Beverage companies, industrial water users
 - Provide funding for project support; recruit employees to volunteer in restoration activities
- State agencies — Water quality protection agencies, such as Departments of Ecology or Environmental Quality, and agricultural departments
 - Provide funding opportunities for watershed assessment (State Source Water Assessment Programs), project planning, and implementation. Contribute information on state drinking water regulations, land cover, or water quality data. State Departments of Agriculture may also be involved in outreach and technical assistance for agricultural landowners.
- Federal agencies — USDA NRCS, US EPA, US Forest Service, USFWS
 - Fund SWP programs. May also help convene stakeholders, provide drinking water and ecosystem information and expertise, and may leverage local staff to work on project or outreach to agricultural or other networks.
- Non-profit organizations
 - May facilitate or coordinate project, highlight funding pathways, and provide conservation expertise.
- Consulting and engineering firms
 - Contribute GIS capabilities for mapping land uses and suitable drinking water protection practices, or conduct restoration work under contract for the project.
- Public
 - Provide comment on project activities, and may also have the option to pay into source water protection projects through drinking water bills.

Funding Sources for Program Development and Operation:

- Municipal drinking water utility budgets and staff resources
- Conservation District or Watershed Council budgets and staff resources
- USDA program grants: farm bill funds, Conservation Research Enhancement Program (CREP), Environmental Quality Incentives Program (EQIP), NRCS funding through Regional Conservation Partnership Programs or the National Water Quality Initiative's Source Water Protection Program
- Drinking Water State Revolving Fund capitalization grant from US EPA
- State legislative monies or grants from state water quality entities, such as Watershed Enhancement Boards or Departments of Agriculture
- In kind or other resources from partners
- Private philanthropy and foundations

EXAMPLE

The McKenzie River, known for its excellent water quality, is currently the sole source of drinking water for the nearly 200,000 customers in the Eugene area served by Eugene Water & Electric Board (EWEB). While most of the land within the McKenzie River Watershed is National Forest land, the riparian corridors are largely in private ownership. These riparian areas are critical to buffering the river from human uses in the watershed, including forestry, agriculture, development, and roads. Beginning in 2011, EWEB's Source Water Protection Program convened a collaborative stakeholder group to design and implement an incentive-based strategy to protect existing healthy riparian areas and restore degraded riparian forests along the McKenzie River through voluntary actions. This led to the design and development of the Pure Water Partners (PWP) program. The project utilizes funding from federal and state governmental programs such as the US Forest Service stewardship contracting, NRCS and Oregon Watershed Enhancement Board grants, as well as EWEB's source water protection budget and contributions from other partners. Alongside the water utility, key partners include the Upper Willamette Soil and Water Conservation District (SWCD), the McKenzie Watershed Council, McKenzie River Trust, US Forest Service, Metropolitan Waste Management Commission, University of Oregon, The Freshwater Trust, and Willamette Partnership, as well as individual agricultural and private landowners.

The SWCD and Watershed Council conduct outreach to riparian area landowners who might be a good fit for one of the three PWP pathways: protection or restoration of agricultural or residential lands, and naturescaping -- a native plant landscaping program for smaller residential parcels. After a GIS analysis is conducted, the Watershed Council or SWCD partners do a site assessment, comparing characteristics of the property with high-quality reference sites in the watershed. The results of this site assessment indicate which PWP pathway is the best fit for the property. The landowner can then sign a long-term agreement with EWEB, which provides for payments (for properties in the protection pathway), restoration work, and technical assistance.

The project is guided by a collaboratively-written Memorandum of Agreement, governance handbook, and documented financial procedures, all of which allows PWP to function efficiently and transparently as a partnership. Another aspect of the program's continued strong forward momentum was PWP's selection of the Willamette Partnership to coordinate the partnership's month-to-month and big picture tasks, which freed up local partners to focus on their program priorities. Ultimately, PWP's effective partnership and process rely on the trust and open communication between partners and program participants, PWP's ability to connect with multiple and varied funding sources, and the partners' continued commitment to the shared goals of drinking water protection and improving watershed health.

Citations:

<https://sourcewatercollaborative.org/wp-content/uploads/2012/06/SWC-Case-Study-Pennsylvania-Maiden-Creek.pdf>

<https://www.epa.gov/sourcewaterprotection/partnerships>

<https://willamettepartnership.org/supporting-collaborative-conservation/>

<http://www.eweb.org/community-and-environment/mckenzie-watershed-protection/landowner-assistance-programs/pure-water-partners>

Other Source Water Protection examples

- [Pure Water Partners, McKenzie River, OR](#)
- [Little Arkansas River Watershed WRAPS, Wichita, KS](#)
- [NYC Department of Environmental Protection Watershed Agricultural Program, Catskill/Delaware Watershed, NY](#)
- [Mackinaw River Watershed wetlands for water improvement efforts, Bloomington, IL](#)
- [Schuykill Action Network, Berks and Lehigh Counties, PA](#)

Partnership Challenges and Opportunities

Numerous examples of source water program partnerships exist in the Pacific Northwest and nationwide, and many of these programs have faced some common challenges:

- Partner staff and resource capacity are often a limiting factor in project execution and timeline. Additionally, things often just move slowly when so many stakeholders are engaged in developing and implementing the partnership.
- Leveraging the wide variety of funding sources available can be difficult without the right partners at the table. Even when funding sources are identified, directing funds to the appropriate areas of the project and the long timeline and involved processes that often accompany federal or state grant programs can become barriers to project success.
- To help ensure that landowners want to opt-in to the program, it's critical to take the time to build awareness, trust, and relationships with landowners in the source water area.
- Any prioritization schema that ranks individual restoration, protection, or best management practice implementation projects within the SWP program must be fair, utilize funding and resources most effectively, and achieve drinking water and watershed health improvements.

However, these partnerships are promising for a variety of reasons, including:

- SWP programs are generally not as contentious as other agricultural-municipal partnerships, and are codified through many governmental funding sources and regulatory pathways, so getting stakeholders into a fruitful, trust-based dialogue may prove less difficult than in other scenarios.
- Although budget management for SWP projects can be complex, if it is delegated to a partner with the proper staff capacity and familiarity with funding pathways (e.g. a non-profit organization) the SWP project can successfully leverage and blend a diversity of funding opportunities.
- Building in flexible options that accommodate the variety of agricultural and private landowner needs and landscapes can encourage a broader group to participate in voluntary restoration, protection, or best management practices.
- Source water protection actions not only allow drinking water utilities to avoid installing costly mechanical filtration methods, they also improve watershed ecosystems and habitat, and can help finance farmers to implement practices that make sense for their bottom line and help them to be stewards of their land.
- Along with restoration work, SWP partnerships have a unique opportunity to take preventative action and avoid future water treatment costs by protecting existing healthy areas of the watershed.

Lessons Learned

A successful source water protection partnership hinges on the development of a voluntary, locally-driven, and incentive-based program for landowner involvement. In most cases, a SWP project can achieve drinking water quality and protection goals while also being more cost effective than other options and building community within the watershed. Although these partnerships may take some time to fully launch, once they do, partners may find themselves unable to meet landowner engagement needs with their staffing and funding abilities. Therefore, streamlining project processes through documentation and involving a third-party organization to take on partnership coordinating tasks can be key ways to help these projects maintain momentum. Finally, because of the high volume of work with individual landowners, these partnerships will also benefit from the creation of a repeatable workflow that utilizes templates and analysis software.



McKenzie River / Kristiana Teige Witherill

"I think more than anything, the success of a source water protection program depends on a multitude of factors: early coordination, common goals and being able to define and document those, involvement of most or all of the stakeholders early on, stable funding and a coordinating organization that can provide consistency over the long-term, collaborative processes and decision making, constant building of trust and assessment of the mechanisms that support trust, and dedicated individuals/organization who are willing to continue the work over the long-term."

— Lily Leitermann, Upper Willamette Soil and Water Conservation District

STRATEGIES FOR MOVING FORWARD

Challenges and Opportunities Across Partnership Models

Although these partnerships can and do operate in many contexts, the examples in this report highlight common elements that can be both challenges and opportunities for stakeholders, partners and organizations seeking to build capacity on the ground and meaningfully engage in watershed resilience work.

- **TRUST AND COMMUNICATION:** In nearly all partnership case studies, interviews, and existing literature that went into creating this report, partners identified building trust as both the cornerstone of a successful project and as one of the project aspects that is rarely fast or simple. Some partnerships grow out of environments where strong, trusting relationships already exist, while some partnerships develop as a way to bring stakeholders together in an environment of conflict. Regardless, consistent, transparent communication between partners and with the public is critical to maintain any foundation of trust that exists. Successful partnerships build or mend trusting working relationships and tend those relationships throughout the partnership, all of which takes time and resources. However, as many interviewees pointed out, “it’s worth it.”

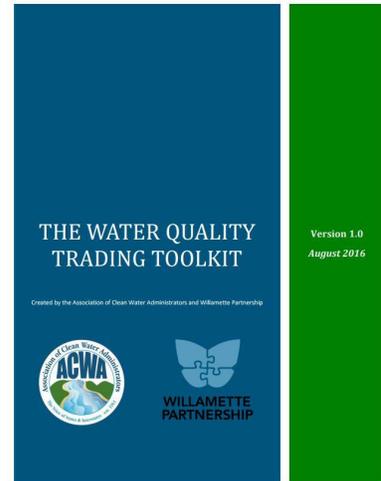
- o *Strategies for moving forward:*

- Map out the critical relationships required for a successful program in a given watershed. This will allow utilities to initiate a dialogue with the full suite of important players and tailor messages to best communicate with each group.
- Build cross-sector regional leadership teams to support agriculture-municipal water partnerships. Identify and convene leaders within the U.S. EPA regions for state water and agriculture agencies, agriculture associations, and utility associations to help them learn how to support their constituents in developing the kinds of unlikely partnerships that need to form at the local level for successful program implementation.
- Provide a small grants program for new agriculture-utility partnerships. Collaborative partnerships can get off the ground more easily if partners have funding to attend meetings, dedicate staff time to work towards progress, and hire third party facilitators to provide administrative support to the partnership.
- Leverage utility investment. Funders can take advantage of the time and effort going into a partnership project by funding complimentary activities that are important for ecological health but may not be aligned with the permittee’s compliance needs (e.g. aquatic habitat improvement, irrigation upgrades). When the projects are bigger and better, more stakeholders will feel that their goals are being advanced through the program. This helps build trust.
- Re-frame how we talk about municipal watershed investment. Framing agriculture-municipal partnerships as a way to optimize the use of resources in a watershed to promote overall environmental and community benefits will engender more support from stakeholders than using language such as, “pollution trading” or “compliance with effluent limits.”



Stakeholders gather to share input with Upper Willamette Soil and Water Conservation District / Kristiana Teige Witherill

- **REGULATORY SUPPORT:** A common barrier that water quality trading, groundwater protection, and water reuse partnerships in particular face is the lack of regulatory frameworks that support development of these partnerships. Without standardized permitting pathways to follow, partnerships can be delayed as they try to ensure that proposed management activities will achieve their compliance requirements. Partnerships have overcome this challenge by collaborating with regulatory agencies as partners who help develop the project, which can be effective if all parties approach the collaboration with openness and a willingness to be engaged. While regulatory pathways are being developed, partnerships can create formal agreements (i.e. Memorandum of Agreement or Understanding) to help structure and give credibility to their work in the meantime.



- o *Strategy for moving forward:*

- Adopt state-wide policies to allow different kinds of agriculture-municipal partnerships. Many states have adopted policies for water quality trading, for example. Resources like Willamette Partnership and the Association of Clean Water Administrators' [Water Quality Trading Toolkit](#) provide templates to make it faster and easier to develop transparent and accountable water quality trading programs.
- Municipalities need to ask for flexible options. The National Network on Water Quality Trading's *Breaking Down Barriers* found that state regulatory agencies consistently reported that conversations about trading in their state were started by permittees looking for more flexible approaches to meeting their permit requirements. It's difficult for state regulatory agencies to dedicate staff time to designing a new program or policy unless there is clear demand from permittees. Municipalities can also help by advocating at the state level for long-term funding for staff positions to ensure capacity for program and policy design and implementation.

- **DATA AND INFORMATION:** An area for technical assistance. These partnerships almost always strive to base management decisions upon reliable science, and this foundation both lends them credibility and can create a stumbling block if the relevant data is not available. Partners can sometimes provide the resources to collect data and conduct monitoring, but more often than not this crucial aspect of developing a project is too large and expensive for partners to undertake alone. There is a need for data, monitoring, and modeling resources to be directed towards these partnerships from non-profits, governmental programs, academic institutions, and any other avenues of ecological or hydrologic knowledge, including traditional ecological knowledge. These partnerships also present the need for information that can help educate regulators and encourage them to support these projects, as well as an opportunity to collect case studies of partnership success and make them available to places considering embarking on this process.



- o *Strategies for moving forward:*
 - Fund data collection and monitoring. Create new or expand the scope of existing government grant and loan programs to include funding for data collection and monitoring.
 - Normalize and allow for municipalities to collect data outside of their jurisdictions. The geographic extent of a partnership project is often outside of the municipality's jurisdictional boundaries, making it tough to spend their monitoring dollars on the project. By making it legal and normal for municipalities to invest monitoring dollars outside of their jurisdiction, more resources can be brought to bear for data collection.
 - Partner with other groups who may be collecting data already. Watershed Councils, universities, and other local or state governments may be collecting data in the project watershed already. Open and transparent collection and sharing of data among these groups can reduce the cost and capacity burden on any one entity.
- **FUNDING:** An area for technical assistance. Management plans across all types of these partnerships involve incentivizing stakeholders to change practices, proposals for watershed restoration work, and data collection and monitoring. Without enough capital, a partnership cannot implement any of these management solutions, so a lack of or inconsistent funding can significantly stall progress. Partners rarely have enough resources to support all of the partnership's needs, so outside funding becomes necessary. While a plethora of grants and other sources exist in the governmental and private realms, identifying, applying for, and administering this funding takes time and knowledge for which partners often do not have the capacity. To address this challenge, many partnerships have a dedicated budget management and grant acquisition team, and involving a non-profit to help navigate funding processes has also been a successful partnership strategy. Finally, partnerships that are well-developed may consider establishing a Project Fund which can be easily accessed for supporting continuous program work.
 - o *Strategies for moving forward:*
 - Incentives for including watershed approaches within facilities plans. Set aside money specifically for grants or offer lower interest rates to utilities that include WQT or other watershed approaches in their facilities plans (U.S. Department of Agriculture (USDA), for example, through USDA Rural Development funding and the Clean Water State Revolving Fund).
 - Fund phase-two projects that build on innovative pilots to grow the number of successful case studies. Grant funding often prioritizes ideas that are new and innovative. This can lead to good ideas being left stranded in the pilot phase because they are no longer considered "new." Funding that is targeted at scaling up successful pilot programs could help programs grow watershed-wide or regionally.

In addition, there are some key opportunities where third party organizations with the skills to provide specific technical assistance, could play an important role in getting emerging partnerships to a stage where they are able to effectively work together to achieve specific water management goals.

- **EQUITY AND ENGAGEMENT:** While agricultural-municipal partnerships often excel at community outreach due to their locally-driven nature, incorporating other aspects of equity into the work of these partnerships is an area for improvement. Public engagement is a key and sometimes required part of the process for most partnerships, but partnerships, potentially with the help of a third-party organization, could work on actively reaching out to groups within the community who may not be able to take part in public comment processes, for example. Additionally, the shorter-term timelines that sometimes define the goals of environmental justice groups' work may prove to be a point of disconnection with slower-moving agricultural-municipal partnerships, but if approached right could also be an opportunity to align the trajectories of each group within one broader framework. For example, a policy framework around flood management could support both the immediate alleviation of flooding injustices that environmental justice advocates want to see, as well as the development of longer-term agricultural-municipal

partnerships to mitigate future flooding risks. Additionally, tribal governments should continue to inform the goals and activities of partnerships, where applicable.

- **PARTNER CAPACITY:** Oftentimes the partners leading the project, such as municipal water utilities and local agriculture or watershed agencies, bring strong commitment, but may find their capacities for funding, staff, and relevant knowledge overwhelmed by partnership demands. To gain partner and community support, it is critical that these groups with stakes in the water issue on the ground can drive the partnership goals and processes, rather than utilizing a top-down approach. However, especially in smaller municipalities or more rural areas, these groups often do not have the capacity needed to sustain the development of a successful partnership. Support from outside partners such as non-profits, state or federal agencies, and others is therefore crucial and impactful in these contexts. In particular, project partners have identified the following areas for assistance: convening and facilitating meetings; contracting out aspects of the project, such as ecological consulting and restoration work; streamlining processes by developing templates and documentation; managing the budget; making materials for and conducting outreach; and gleaning information and case studies to guide or jumpstart a newer partnership.
- **POTENTIAL FOR CREATING PARTNERSHIPS WITH PRIVATE CORPORATIONS:** One emerging opportunity is leveraging corporate partnerships. Corporate partners interested in clean water, carbon offsets, sustainability, and quality of life for their employees can provide funding and capacity; serve as community ambassadors for the project; and source project volunteers from their workforce.

Conclusion

Agricultural-municipal water partnerships have a track record of both delivering collaborative, locally-rooted, holistic approaches to complex watershed issues, and of achieving compliance goals and stacking community and ecological benefits. The success stories of these partnerships continue to add up, including the examples mentioned in this report, and can provide solid models for other potential partnership areas. As regulatory frameworks, funding opportunities, and technical assistance develop, these partnerships are steadily becoming more attractive and viable for a broad range of contexts.



Intel contributed financial resources to Clean Water Service's water quality trading program and helped to recruit volunteers to plant trees / Clean Water Services

APPENDICES

Appendix I: Interviewees

Special thanks to all of the people who contributed the time and knowledge that this report is built on.

Name	Organization Affiliation	Agricultural-Municipal Partnership Affiliation
Ryan Anderson	WA Resources Conservation and Development Council	
Justin Berrens	Waupaca Public Works Director	Waupaca Cropping Agreement
Scott Berry	US Water Alliance	
Brad Bogus	Consulting engineer	Hermiston Water Reuse Project
Bev Bridgewater	West Extension Irrigation District	Hermiston Water Reuse Project
Brian Cochrane	WA State Conservation Commission	
Kari Cohen	NRCS Conservation Innovations Team	
Bartlett Durand	Sand County Foundation	
Jay Gordon	WA State Dairy Federation	
Rachel Hagerty	Tillamook County	Southern Flow Corridor Project
Clive Kaiser	OSU Hermiston Agricultural Research and Extension Center	Lower Umatilla Basin Groundwater Management Area Committee
Lily Leitermann	Upper Willamette SWCD	Pure Water Partners
Scott Lukas	OSU Hermiston Agricultural Research and Extension Center	Lower Umatilla Basin Groundwater Management Area Committee
Jen McNelly	Portage County Water Resource Specialist	
Erin O'Brien	Wisconsin Wetland Association	Little Plover River Watershed Enhancement Project
Aaron Palter	Port of Tillamook Bay	Southern Flow Corridor Project
Brenda Smith	High Desert Partnership	Harney County Community-Based Water Planning effort
Chris Thomas	The Freshwater Trust	Medford Water Quality Trading Program
Nancy Toth	Eugene Water and Electric Board	Pure Water Partners

Appendix II: Potential Washington State partnership opportunities

These were suggested by various interviewees and may present potential avenues for supporting ag-municipal partnership development in Washington.

- WQT in the Yakima Basin: focused on Total Suspended Solids (TSS), turbidity, temperature, and/or suspended sediment; partners could include City of Toppenish, WA Department of Ecology, Yakama Nation, and Yakima Basin farmers.
- WQT in the Chehalis watershed: focused on temperature and/or dissolved oxygen; partners could include parties with stakes in fish habitat restoration and water quality requirements.
- WQT in Spokane watershed: focused on dissolved oxygen (phosphorus); a WQT program almost got off the ground here, but was stalled by lack of a standardized regulatory framework and lack of a credit market.

- WQT in the Walla Walla River Basin (Dayton): focused on nutrient water quality limits; partners could include the City of Dayton, agricultural landowners, WA Department of Ecology.
- WQT in the Little Klickitat River watershed (Goldendale): focused on temperature and/or other water quality TMDLs; partners could include agricultural landowners and the City of Goldendale, WA Department of Ecology.

Appendix III: Interview questions

For People in Active Partnerships

1. We know there are many different types of ag-muni water partnerships that address various issues: water quality, source water protection, flood management, groundwater quality/quantity, and water reuse systems (define and give examples if needed). How would you describe the partnership you are participating in? Does it match any of these types, or any aspects of these types of partnerships?
 - a. What are the goals and/or regulatory drivers that drive your partnership?
2. Who are the most important people involved in your partnership? What roles do they play? Are there any groups of people or organizations you think are missing from being involved in your partnership?
3. What challenges or barriers have you faced so far, in either partnership formation or on-the-ground implementation?
4. Willamette Partnership is looking to improve how we and others provide technical assistance to these partnerships, so what do you wish you had from someone? What financial or technical assistance (tools, information, data, or added capacity) would help you overcome the barriers you faced? What areas of technical assistance do you advise WP to focus on?
5. How have you thought about engaging low-income, rural, or other folks who haven't historically been part of water conversations, such as Black, Latinx, Native American, and other communities of color in your work and the partnership? How do you think your partnership already does benefit these groups, and what opportunities do you see for increasing engagement and benefits?
6. What advice or recommendations would you have for other organizations thinking about forming an ag-muni partnership?
7. Who else do you think I should talk to?

For Other Outside Experts

1. We know there are many different types of ag-muni water partnerships that address various issues: water quality, source water protection, flood management, groundwater quality/quantity, and water reuse systems (define and give examples if needed). What different kinds of partnerships do you know of? How would you characterize each of those partnerships?
 - a. What are the goals and/or regulatory drivers that drive partnerships you know of?
2. Who do you think should be involved in each type of ag-muni partnership, and what roles should each entity have for a successful collaboration?
 - a. Are there any groups of people or organizations you think are typically missing from being involved in these partnerships?
3. What challenges or barriers do you see for these partnerships?

4. Willamette Partnership is looking to improve how we and others provide technical assistance to these partnerships, so what financial or technical assistance (tools, information, data, or added capacity) do you think would help these partnerships overcome these barriers? What areas of technical assistance would you advise WP to focus on?
5. How do you think these partnerships can/should engage low-income, rural, or other folks who haven't historically been part of water conversations, such as Black, Latinx, Native American, and other communities of color in their work and the partnership?
6. Who else do you think I should talk to?