

MIDWEST WATERSHED PARTNERSHIPS

Successes, Challenges, and Immediate Opportunities



ENVIRONMENTAL POLICY
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ABOUT

Sand County Foundation is a nonprofit conservation organization dedicated to working with private landowners across North America to advance ethical and scientifically sound land management practices that benefit the environment. The Environmental Policy Innovation Center (EPIC) is a fiscally sponsored project of Sand County Foundation.

The mission of EPIC is to build policies that deliver spectacular improvement in the speed and scale of conservation. We focus on a narrow set of strategies:

- Improving policies that allow private sector funding or stewardship to expand or supplant public or charitable conservation work
- Transforming government policies to focus on what matters— outcomes
- Eliminating the organizational barriers that prevent public agencies from adapting to 21st century solutions

EPIC’s agriculture program uses cutting-edge technologies and novel policy solutions to 1) develop new sources of demand for conservation outcomes, 2) ensure conservation dollars are spent as cost-effectively and quickly as possible, and 3) incentivize the creation of new solutions to the most pressing resource concerns.

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EXECUTIVE SUMMARY

Over the past three years, Sand County Foundation has helped nine municipalities negotiate MOUs with the Iowa DNR that outline how a city with a NPDES discharge permit can generate nutrient reduction offsets by accelerating the use of conservation practices in their watersheds. These efforts led to the creation of a how-to guide for municipalities and a template MOU, which was adapted by Kansas to create its own version of watershed partnerships. Over the same time, IDNR has developed and staffed a process to validate the credits generated by MOU participants.

These watershed partnerships are necessary because nonpoint source sediment and nutrient pollution is widespread and is not regulated under the Clean Water Act. In states like Iowa where the landscape is dominated by crop and livestock production, water quality cannot be significantly improved without addressing agricultural nonpoint source contamination.

The biggest challenge throughout this project has been the pace at which state regulators—and sometimes city governments—operate. The Iowa program to validate and track credits has taken several years to launch, generating a backlog of credits to be validated. In Illinois, the MOU developed for the Northern Moraine Wastewater Reclamation District (the first in the state) has been under review by the Illinois EPA for over two years. Because of the regulators' caution, potential for lawsuits, comfort with gray infrastructure, and more, many cities prefer to take a "wait and see" approach that severely limits the pool of potential early adopters.

Future opportunities include reaching out to those cities and also exploring the database of industrial NPDES discharge permit holders for opportunities to accelerate conservation practices to offset nutrient discharge under industrial permits. More work can be done to improve the processes for validating credits and making those processes be easily adaptable to additional states. Finally, water engineering firms who service municipalities play a major role in selecting compliance pathways. A paradigm shift towards green infrastructure has begun to occur with some firms, but many more could be recruited.



Banner Marsh, Peoria County, Illinois

BACKGROUND

The 1972 Clean Water Act created strong regulations on point source polluters that have addressed many of the most egregious instances of water quality degradation across the United States. But nonpoint source pollution is logistically and politically a much trickier problem to address. In particular, nutrients and sediment from agriculture are the most widespread stressors of rivers and streams. In many places, such as Iowa, increased pressure to reduce nutrients in waterways is only applicable to point sources, resulting in diminished margin returns to investments. For instance, [92% of the nitrogen](#) load to Iowa streams comes from nonpoint sources.

Successive presidential administrations have worked to address this imbalance by linking point and nonpoint sources to allow for nutrient reductions at the watershed scale. The Obama administration released the “[Stoner memo](#)” that recommended the establishment of numeric nutrient criteria and encouraged the use of “N & P markets” to “target the most effective practices where they are needed most.” The Trump administration further [made clear](#) that it supported water quality trading and took steps to clarify what farms’ baseline requirements were before they could participate in such markets. The only Sense of Congress in the [2018 Farm Bill](#) expressed support for watershed approaches to managing nutrients. In April 2022, the Biden administration released its own “[Accelerating Nutrient Pollution Reductions in the Nation’s Waters](#)” that described their method to incorporate market-based approaches into point source permits, deepen collaborations with agriculture, and drive innovation.

Wisconsin pioneered this approach and has provided one useful example to look to. Their original [adaptive management option](#), created in 2010, allows wastewater permit holders located in watersheds with point and nonpoint water quality impairments to address their permit’s phosphorus (P) and total suspended solids (TSS) limits via a plan for the whole watershed that includes quantifiable reductions from farms and other nonpoint sources. One example of such a partnership is the Yahara Watershed Improvement Network, which brought together three wastewater plants, 24 MS4s, a farmer-led watershed group, and many more to address nutrients in waterways at the watershed scale. Wisconsin has also recently developed a [clearinghouse](#) to facilitate transactions in its market for water quality improvements.



SUCCESSSES

Overall, the project accomplished most of its goals to develop watershed partnerships and had several unanticipated successes. The number of Iowa municipalities covered by a MOU exceeded the goal, millions of municipal tax dollars have been spent under these MOUs and hundreds of thousands of pounds of nutrients have been prevented from entering waterways. Simultaneously, Sand County Foundation staff have developed tools to make it easier for municipalities in Iowa and beyond to receive credit for improvements in water quality throughout their watersheds.



A total of nine Iowa cities have signed memoranda of understanding with the state Department of Natural Resources to establish watershed partnerships. These cities range in size from under 4,000 people to the second largest in the state and from northwest Iowa to southeast Iowa. While some have just signed their agreements recently, others have established processes and devoted significant sums to watershed work.

It can be difficult to tease out how much of the funds cities have been induced to spend are directly producing credits against their permits, but it's assured that that number is well over a million dollars. One city alone has generated over 420,000 pounds of creditable nitrogen reductions into waterways since signing their MOU. In another city, the wastewater department requested \$100,000 for watershed work, and the city council—understanding its relative cost-effectiveness—insisted on appropriating \$200,000; they now plan to keep doing so annually for the next 20 years. City managers credit watershed partnerships with helping them fund dramatic reductions in flood risk and providing the flexibility to minimize impacts on ratepayers. In addition to the resources contributed directly by cities in the program, most municipalities have been able to leverage their resources with external grant support and/or additional cost share for watershed work from the agriculture and food industry.

Over the same time period, Iowa DNR has instituted and staffed a process to validate credits using the nutrient reduction exchange. While this system was in development for years, it is now fully operational and has worked through much of the backlog of credits. With satisfied early adopters and an established state methodology, watershed partnerships in Iowa have significant room to continue growing into a self-sustaining solution for nonpoint nutrient reductions.

SCF staff were able to accomplish this (along with partners) by helping develop MOUs from the very beginning, conducting significant outreach to cities, and generally trying to lower barriers to participation. One of the most crucial aspects was technical assistance for the MOUs. Once the first few were developed, this became mostly straightforward, but some cities did have unique goals or concerns that led to tweaking MOUs, and without this ability they may not have participated. The outreach included letters targeted directly to cities to show them how their discharges compared to their peers and their goals, as well as working with statewide organizations like the Iowa League of Cities to host webinars. Once a city expressed interest, staff would typically meet with them in person to hear any concerns and develop a plan for executing on their partnership goals. After working with many cities directly like this, SCF staff developed a [how-to guide](#) that the DNR and other entities can share with any future interested cities.

More detailed information on the status of watershed partnerships in Iowa can be found [here](#).



KANSAS

Since the early 2000s, Kansas has made considerable progress on technological improvements for point source entities discharging nutrients. This has shown up in cleaner water at base flow and dry weather. However, in wet conditions and high flow, nonpoint source loading still needed addressing. Therefore, the Kansas Department of Health and Environment (KDHE) was looking to credit permitted stormwater entities (MS4s) for deploying best management practices on the rural landscape. On a per pound of phosphorus prevented from entering waterways basis, it's much cheaper for cities to implement BMPs outside of their borders. In addition, many cities in Kansas depend on reservoirs as a source for their drinking water and are increasingly interested in protecting these sources from agricultural runoff.

To accomplish this regulatory crediting, the KDHE borrowed language from the watershed partnerships agreement that was developed in Iowa. El Dorado now has a signed an agreement allowing them to address nutrient and sediment loading upstream of the city. El Dorado, as well as other Kansas cities, understand that the reservoirs that serve as source water for their citizens, are impacted by land use outside of the cities' jurisdiction. They have partnered with the [Soil & Water Outcomes Fund](#) to supply and monitor phosphorus reduction outcomes.

Wichita, Manhattan, and Lawrence are all similarly interested in creating this framework for investing in up-stream nonpoint source run-off reduction projects. KDHE plans to expand this model more broadly in the state in the coming years.

Additional information about the process of developing agreements in Kansas can be found [here](#).



Quivera National Wildlife Refuge, Stafford County, Kansas

CHALLENGES

One of the biggest challenges to this work has been the pace of improvements by the regulatory agencies that have jurisdiction over point source impacts to water quality. At the risk of stating the obvious, this is probably why many of these solutions have been talked about for decades and are only now being implemented. While agricultural conservation-focused departments (such as [IDALS](#)) have been quick to support opportunities to bring additional funding to on-farm conservation, regulatory agencies see themselves as having much greater constraints because of their requirements under state and federal law. In one state, this slowness has so far been insurmountable.



ILLINOIS

After months of negotiations with Illinois EPA and working with a municipality, Sand County Foundation staff presented a complete MOU to the Illinois EPA in August 2021. The prep work and negotiations included close coordination with the Deputy Director and Chief of the Bureau of Water. Included with the MOU were written letters of support from Illinois Association of Wastewater Agencies, Illinois Environmental Council, and others. The US EPA Region 5 administrator, Deborah Shore, was briefed on the approach and voiced support.

Despite insistence that the MOU was working its way through approval processes for over two years, the MOU has not been approved. Sand County staff have been assured that it's cleared two of the three levels of review but got stuck on some sub-steps of the third level (fiscal review). These excessive processes create so many opportunities for a new initiative to fall through the cracks, while disempowering any individual from championing the initiative from start to finish.

This seemed to be driven by a culture focused on process to avoid any mishaps, even at the expense of actually delivering solutions. The Illinois EPA also seems to be understaffed, creating additional challenges in trying to convince any employee to try something new that might increase their workload in the short term. It's also possible there are additional complicating factors in Illinois, such as being spread between three very different watersheds and the unique demography of the greater Chicago area being so densely populated and other regions being very sparse, unlike Iowa which has small and mid-sized towns interspersed with farmland throughout the state.

An additional issue in Illinois was that the reclamation district that originally volunteered to be part of the first MOU got discouraged by the delays and began pursuing other approaches for watershed restoration. But at the same time it became extremely difficult to recruit other municipalities because they wanted to wait and see how the process worked for the first one.





IOWA

The pacing issues were also observed in Iowa but manifested quite differently. Iowa supported development of the MOUs with relative ease but had struggled to operationalize a system for validating credits that will be applied to permits. Theoretically, the process for validating credits should entail something like:

1. A city submits documentation that practices have been implemented with city funds and all the necessary inputs to run the Nutrient Tracking Tool or other models that determine the pounds of nutrients prevented from entering waterways.
2. IDNR staff use those inputs to run the model and validate the number of credits generated. They may also determine that they should make some in-field spot checks to guarantee practices were completed to appropriate specifications.
3. All credits verified by IDNR are submitted to a public registry, the [Nutrient Reduction Exchange](#), to clearly document the reductions that have occurred and updated permit statuses.
4. The city has certainty that they've met their permit requirements.

The bulk of this validation process was originally expected to be handled by Extension faculty at Iowa State University, but staff there later determined the proximity to a regulatory function could be detrimental to their educational mission. IDNR then struggled for over a year to hire a staff person specifically to validate runs of the [NTT](#) model to generate credits but also to more broadly support development of this process for watershed partnerships. The Department has been hamstrung by political efforts to redirect funding from agencies seen as focused on regulatory water quality improvements to those focused on voluntary improvements, but those efforts have in this case made it harder for farmers to access funding for voluntary conservation that would provide demonstrable water quality benefits.

In both states, the development of a process could have gone much more smoothly if there were a model process that could be easily replicated across state lines.



IMMEDIATE OPPORTUNITIES

While significant progress has been made in the past three years, additional issues and prospects have been revealed. The next phase of scaling watershed partnerships across the midwest will likely include work within the states that already have MOUs in place, as well as a greater focus on developing processes that can be used by multiple states.

Additional cities

The most obvious future prospect is to continue recruiting additional cities to sign MOUs creating watershed partnerships. In all three states, there is at least some momentum right now that will make it easier to continue the work now rather than pick it up again in a few years or expect it to be fully self-sustaining at the same pace. Now that IDNR is working through the backlog of credit validation, Sand County Foundation has identified dozens of cities that are potentially a good fit but have chosen to wait to see how the process works for early adopters. Many of these cities will be interested in pursuing MOUs as soon as the credit validation backlog is fully cleared.

There is much work to be done in Kansas. While El Dorado has an agreement signed, a handful of additional cities have expressed some level of interest. So far, these include Wichita, Manhattan, and Lawrence. As with Iowa early adopters, Sand County Foundation is eager to provide technical guidance to cities on meeting their unique goals and actually executing on the MOUs.

Even in Illinois, it would be better to continue work now before the officials at Illinois EPA who understand this concept have moved into different roles. None of them have expressed actual ideological opposition to watershed partnerships, just delays created by process requirements. However, it would be most useful to recruit additional cities to submit MOUs, because the original partner, Northern Moraine Wastewater Reclamation District, is considering alternate means to conduct watershed work. Convincing more cities to submit an MOU will be difficult, because most have expressed a desire to first see it working for someone else. But Sand County Foundation staff have established relationships in the state over the course of this project that have compiled a list of at least three municipalities that may be interested in participating.

Greater inter-city collaboration

Wisconsin's watershed partnerships—as mentioned earlier—can involve as many as 27 permittees in one partnership. In Iowa, Sand County Foundation has identified at least one opportunity to develop a watershed partnership between multiple cities and the DNR.

Mason City and Forest City are located fewer than 30 miles apart, both along the Winnebago River in Iowa. Mason city (downstream) wants to mitigate flooding but has less need for nutrient credits, while Forest City (upstream) has significant need for nutrient credits and owns land on which BMPs could be implemented that both generate credits and reduce downstream flooding. The cities have signed identical MOUs with DNR and are now exploring the creation of a Watershed Management Authority, an intergovernmental entity, that would be the main party in a superseding collaborative MOU with DNR.

One of the big remaining questions for a multi-city agreement like this is how credits would be allocated among the point source entities party to the agreement. Plenty of opportunities for this kind of collaboration already exist, and more will emerge as more cities in Iowa sign MOUs. The technical assistance and connective learning Sand County Foundation has provided so far will be key to the successful formation of the first multi-city agreement.

Innovative credit generation

Cities have so far used a variety of techniques to generate nutrient reductions that can be credited against their permits. These include both edge of field and in-field agricultural best management practices, as well as urban stormwater control designs.

One interesting strategy has been to require farmers leasing city-owned land to adopt specific management techniques that can be quantified as generating a nutrient reduction. For instance, Cedar Rapids took this approach on farmland they city owns near its airport and leases. There are likely more cities that could adopt this low-hanging fruit, and there could be additional, more efficient ways for cities to expand this concept. Could a city work directly with large non-farming landowners to get them to include similar requirements in their lease agreements?

Osage, Iowa—the most recently-signed MOU—offers an exciting premise for a new kind of credit generation. Osage entered into a watershed partnership because a manufacturing facility for [Valent Biosciences](#) wanted to [scale up](#) operations, which would require adding additional nutrients into the wastewater stream beyond what the plant could handle. Among other products, Valent manufactures biologic alternatives to chemical fertilizer, so it's theoretically possible that their products could be used to help farmers reduce runoff and the credits could be used by the city to offset waste from production.

This concept opens up more possibilities for generating city credits from tests of conservation innovations. A city could potentially provide some of the match for a [Conservation Innovation Grant](#) that directly measures the nutrient reductions from a new product that has not been incorporated into an ecosystem services model, in exchange for the city keeping any nutrient reduction credits generated.

National comparison

There are now enough states that have attempted some form of water quality trading and/or watershed partnerships that a nation-wide comparison is warranted for understanding what does or does not work.

The research could explore a variety of possible factors like which EPA region the state falls in, proximity to a major water body, whether the state uses numeric nutrient standards, and the prevalence of agriculture. So far, the most common thread seems to be having at least one person very dedicated to making it happen.

If not a full national assessment, a more modest project could be to compare specific bureaucratic processes in Illinois and Kansas to understand why one was able to move relatively quickly while the other is lagging.

Improving processes for validation

Overwhelmingly, states need a faster and easier process that can readily replicate across the country to handle the validation and tracking of credits generated under a watershed partnership system. This stumbling block is still handicapping Iowa's system and will need to be addressed soon in Kansas.

There are some potential models that could be explored and turned into templates. Iowa's process for registering credits is built on the Army Corps of Engineers RIBITS platform, which EPIC has [worked to improve](#). The Wisconsin Water Quality Trading Clearinghouse provides another potential model for validating and registering credits, despite the fact that the quantification tools used for phosphorus reductions (SNAP+) is unique to that State.

Expertise in contracting for environmental outcomes will play a key role in designing this system. So, any future project should look to the examples of states buying water quality outcomes, such as in Vermont and Maryland.

Lastly, a key lever in helping municipalities lean-in to watershed approaches is their contract engineering firms that possess significant influence in waste water management decision making. Sand County Foundation has been able to move the needle with some firms in Wisconsin, and both the professional societies and other venues in Iowa would likely be receptive to ideas about new ways to serve their clients' water quality goals.

CONCLUSION

This project has established proof of concept that watershed partnerships are valid and powerful tools to address nonpoint source nutrient pollution. But they are still only providing a small fraction of the reductions needed to restore Mississippi River and Gulf of Mexico health. Without changes to the Clean Water Act, watershed partnerships, which link point and nonpoint sources, will increasingly be important tools to prevent nutrients from entering waterways, harming aquatic ecosystems, impacting public health, and raising the cost for water utilities. Excited by the success with early adopters in Iowa and now Kansas, there exists an opportunity now to bring this concept to maturity by creating more partnerships that generate nutrient reductions in new ways and by addressing the key process obstacles in a manner that helps this concept scale within and beyond states.



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