



IOWA WATER QUALITY INITIATIVE

2017 LEGISLATIVE REPORT

2016: Three Years of Progress Through the WQI

We continue to see collaboration around the Iowa Nutrient Reduction Strategy (NRS) build exponentially. More Iowans are engaging, and we see new partners provide additional resources and expertise. **In 2016:**

- IDALS was awarded an additional \$9.5 million in funding over the next five years from USDA-Natural Resources Conservation Service (NRCS) to support six of 16 Water Quality Initiative (WQI) watershed demonstration projects and three of the nine Water Resources Coordinating Council (WRCC) designated HUC-8 Priority Watersheds through the USDA-NRCS Regional Conservation Partnership Program (RCPP).
- \$3.8 million was made available statewide for participants to install in-field management practices to reduce nutrient loss.
- A professional services contract was implemented with two local firms to advance scale and efficiency of edge-of-field practice installation in priority areas.
- The extensions of the first eight Demonstration Watershed Projects will build on early successes, emphasize practice implementation, and continue engagement with local farmers, landowners, and partners.
- Farmers and landowners have obligated over one-third of available funding from the first RCPP awarded with 3.5+ years left of the five-year project.
- Continued development of comprehensive accounting of efforts and practices underway that support the NRS. The 2016 report can be found here: nutrientstrategy.iastate.edu/documents.



Bill Northey
Iowa Secretary of Agriculture

Iowa Water Quality Initiative

The Water Quality Initiative was established during the 2013 legislative session to help implement the Nutrient Reduction Strategy (NRS). The NRS provides a road map to achieve a 45% reduction in nitrogen and phosphorus losses to our waters using an integrated approach that includes point and non-point sources working together for improvement.

The WQI seeks to harness the collective ability of both private and public resources and organizations to rally around the NRS and deliver a clear and consistent message to the agricultural community to reduce nutrient loss and improve water quality in Iowa and downstream.

Statewide Practices Cost-Share - FY 2017

In July of 2016, \$3.8 million was obligated to applicants through Soil and Water Conservation Districts (SWCDs) for cost share on conservation practices through the WQI. As in previous years, farmer and landowner interest remains high in new water quality practices and all available funds were obligated quickly. Over 1,900 farmers signed up for funding in 2016, committing an estimated \$6 million of their own money to implement these practices.

The funding was again targeted to first-time users of four practices: no-till, strip-till, N inhibitor, and cover crops. As in 2015, the program expanded into offering a lower incentive rate for past users as a way to work with cover crops in additional years and weather conditions.

As in past years, the vast majority of the sign-ups were for cover crops. Surveys of applicants are being taken to provide farmer input and improve delivery of state programs. The surveys returned by the time of this report indicated that 80% of cover crop applicants through WQI in 2016 indicated they are planning to continue the use of cover crops as a conservation practice.

WQI Statewide Practices FY2016 Recap

WQI Statewide	FY2015 Application Totals	Nitrogen Reduction (tons)	Phosphorus Reduction (tons)
Cover Crops	151,100 acres	643.4	17.9
N Inhibitor	3,390 acres	4.8	NA
No-till/Strip-till	3,470 acres	NA	0.3
Totals		648.1	18.2

Table represents calculated load reductions of nitrogen and phosphorus based on practices installed in FY2016 through Statewide WQI.

**This does not include practices installed through other state/federal programs or privately funded efforts.*

Targeted Practice Demonstration Projects

In 2016, IDALS awarded funding to three new projects in targeted locations and/or cropping systems that lend themselves to expanded adoption of specific NRS practices and/or practices that have a disproportionate impact on water quality. These projects are also focused on innovative delivery and new methods/partnerships to build the capacity to deliver technical and financial assistance and position for expansion with additional resources. The increase in assistance leads to the installation of practices on a broader scale. A total of seven practice demonstration projects are currently underway.

2016 WQI Practice Demo Practice Summary

	Installed to Date	Currently Obligated	Units
Cover Crops	16,887	23,512	acres
Denitrifying Bioreactor	2	7	no.
Saturated Buffer	-	4	no.
Wetlands	-	4	no.

Iowa Leaders in Conservation

Iowa Farm Environmental Leader Award recipient, Chris Foss of Foss Farms, is a recognized leader in Black Hawk and Tama Counties and an integral part of the Miller Creek WQI Watershed Demonstration Project. In addition to cover crops, strip-till, grassed waterways, buffers, among others conservation practices, Chris installed his first bioreactor in his watershed in 2016.

Through the WQI and NRCS, Chris not only received technical and financial assistance to install the bioreactor, he was also able to participate in a monitoring program through the project.

"We strive to be good stewards of the land and make it a goal to leave the land in better shape than when we started farming it... After participating in the water monitoring program offered by the Black Hawk Soil and Water Conservation District, we have seen nearly a 50% reduction in nitrogen coming off of one of our fields where cover crops were planted. We plan to continue participation in the monitoring program and are interested in seeing if the nitrogen retained would be available to the corn." - Chris Foss



Targeted Demonstration Watershed Projects

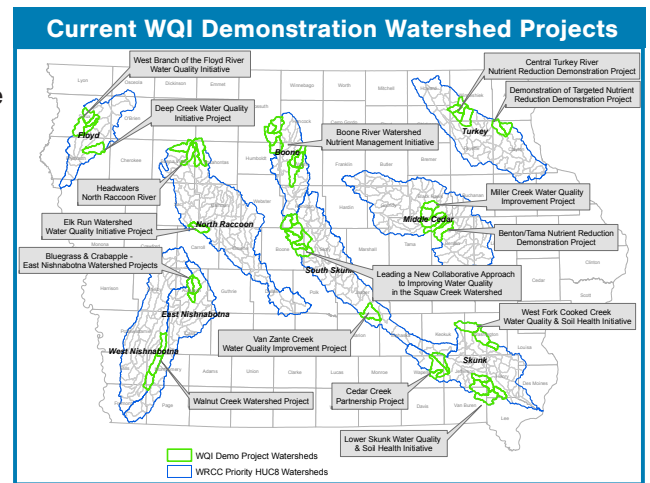
In 2016, IDALS funded extensions for the first eight WQI Demonstration Watershed Projects to build upon the early successes. Their purpose is to help implement and demonstrate the effectiveness and adaptability of a host of conservation practices highlighted in the NRS on a watershed scale.

These projects utilize the collective resources of their partners to demonstrate conservation practices paired with strong outreach and education components.

The \$3.8 million in state funding supporting these eight project extensions is leveraged with nearly \$6 million in additional funding provided by partners and landowners. WQI is funding 16 demonstration watershed projects in total.

More than 145 organizations are participating in the WQI demonstration projects, including partners from agriculture and conservation organizations, institutions of higher education, private industry, and local, state, and federal agencies. All are working with the respective Soil and Water Conservation Districts (SWCDs) and others as they serve as project leaders.

This effort promotes farmer-to-farmer interaction to increase awareness through – and adoption of – available practices and technologies. Successful projects serve as local and regional hubs for demonstrating practices and providing practice information to farmers, peer networks, and local communities.



2016 WQI Practice Demo Practices Summary

	Installed to Date	Currently Obligated	Units
Cover Crops	54,390	25,747	acres
Denitrifying Bioreactor	2	3	no.
Drainage Water Management	166	-	acres
Extended Rotation	136	11	acres
Grade Stabilization Structure	2	-	no.
Reduced/No-tillage	14,681	6,019	acres
N Application Mgmt	16,910	9,436	acres
P Application Mgmt	12,823	7,621	acres
Pasture and Hayland Planting	32	-	acres
Saturated Buffer	2,711	750	ft.
Terraces	158,791	128,802	ft.
Water & Sediment Control Basin	2	1	no.
Wetlands	1	4	no.

Summary of practices implemented since 2014 and currently obligated for funding in the WQI Targeted Demonstration Watershed Projects.

**This summary only accounts for practices installed through State WQI funding and does not account for practices installed through other programs or by landowners themselves.*

2015 IDALS Regional Conservation Partnership Program (RCPP): Iowa Targeted Demonstration Watershed Partnerships Project

In 2015, IDALS was a recipient of \$3.5M through the USDA-NRCS Regional Conservation Partnership Program (RCPP). This project leveraged WQI and other partner funding in 8 WQI watershed projects (from above) to expand delivery of key practices in those priority watersheds. Since the start of this 5 year project, the individual projects have obligated over \$1M to practices less than 1.5 years into the project with interest far exceeding availability. Practices include over 80 water and sediment control basins, four grade stabilization structures, 19 acres of grassed waterways, and multiple saturated buffers and bioreactors, among other practices.

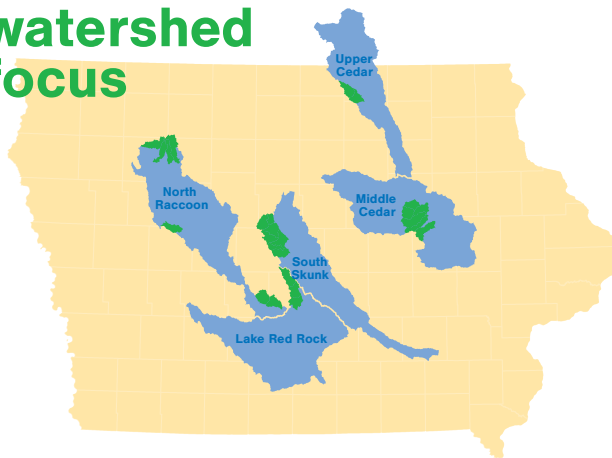
Midwest Agriculture Water Quality Partnership RCPP

USDA-NRCS Regional Conservation Partnership Program (RCPP) has awarded \$9.5 million to the Midwest Agriculture Water Quality Partnership. The Partnership is co-led by IDALS and Iowa Agriculture Water Alliance (IAWA) and involves 43 additional partners. This project will work with a diverse group of committed partners to engage farmers and help scale-up the water quality efforts in the targeted watersheds. The \$9.5 million grant is the largest National Funding Pool award in the country in 2016. These funds will be leveraged with \$4.75 million in state funding (\$2.5 from IDALS and \$2.25 from Iowa DNR) and \$33 million from the private sector. Farmers and landowners will be making additional investments that are not included in these amounts. The project will build an innovative public-private collaboration focused on improving water quality, soil health, and habitat for at-risk species. The partnership has brought together diverse stakeholders from multiple sectors committed to improving water quality as guided by the Iowa Nutrient Reduction Strategy. The initiative is focused on engaging local partners, such as agribusinesses, ag retailers, seed companies, and ag organizations, to deliver and demonstrate water quality practices and technologies proven to have a significant impact on reducing losses of nitrogen and phosphorus. These practices include cover crops, nutrient management, strip-till and no-till, drainage water management, bioreactors, saturated buffers, and wetlands.



Saturated buffer installation in Dallas County as part of RCPP project

watershed focus



The project will merge traditional approaches to deliver conservation through scaling up conservation planning and conservation practices with a non-traditional, highly innovative precision agriculture platform integration component that will lead to greater practice adoption and improved conservation outcomes. The initiative will help leverage private sector precision agriculture tools to deliver conservation and water quality improvement. The initiative will be focused in targeted watersheds within the North Raccoon, South Skunk, Lake Red Rock, Middle Cedar, and Upper Cedar watersheds (map left).

Edge-of-Field (EOF) Technical Assistance

In 2016, IDALS selected two experienced local firms to provide valuable technical and engineering assistance for edge-of-field (EOF) practices in priority watersheds through WQI. While these practices are very effective at reducing significant amounts of nutrient loads, additional capacity was needed to support delivery through traditional means due to their very targeted nature and newness of the practices.

The two entities selected were the Iowa Soybean Association, with additional assistance from Ecosystem Services Exchange, and ISG, and they will provide services related to feasibility analysis of a particular site for a practice, design services, and oversight.

Funds directed toward these efforts will help expand upon delivery in these priority areas and be used to help inform scaled-up delivery of these important practices.



Bioreactor installation in Miller Creek Watershed - Black Hawk County photo courtesy of Kristi Heffelmeier

Tracking/Accountability

IDALS, IDNR, and ISU continue to work on development of a robust qualitative and quantitative framework through the Measures Subcommittee of the WRCC. The development of a logic-model-type framework is being employed to collect and report on progress made through the NRS. The second annual report using the logic-model framework was completed and presented to the WRCC in the summer of 2016. This report is available at nutrientstrategy.iastate.edu/documents.

Many factors have been identified to measure progress, from inputs (e.g. funding) and the human domain (e.g. farmer/landowner perspectives) to land management (e.g. on-farm practices) and water quality. This section will focus on the water monitoring of nutrients part of the logic model.

Water

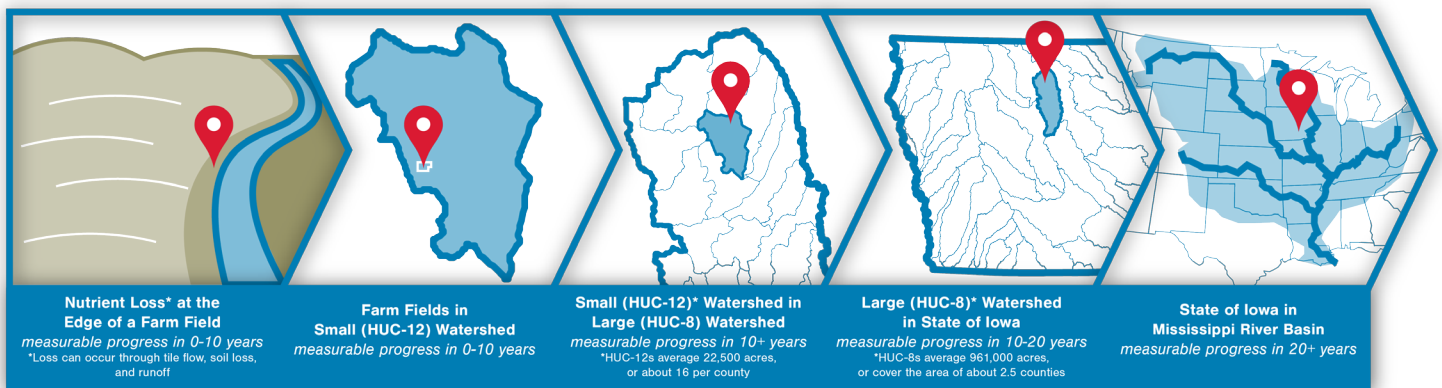
The Iowa Nutrient Reduction Strategy (NRS) aims to reduce the load, or total amount (e.g. tons), of nutrients (N & P) lost annually. Researchers calculate the load from data of stream monitoring sensors, which measure concentration and flow.

IDALS collaborated with DNR, IIHR, and ISU to develop a collaborative report titled “Stream Water Quality Monitoring Conducted in Support of the Iowa Nutrient Reduction Strategy,” available at nutrientstrategy.iastate.edu/documents.

Even with this extensive water-monitoring network, measuring changes in natural ecosystems presents several technical, scientific, and policy challenges. The report outlines a number of those challenges, including legacy nutrients, lag time, limitations of conservation practice data, extreme weather events, variable precipitation, stream flow, locations of monitoring sites, and importance of long-term data collection.

Scale

One consideration is scale of monitoring for nutrients. Below is a summary of various scales of monitoring and examples conducted in Iowa.



Edge-of-Field Monitoring

The Iowa Soybean Association, ISU, and a number of other groups conduct monitoring at edge of farm fields through farmer collaboration and on research sites. This scale of monitoring is used to inform, target, and prioritize implementation due to ability to implement measures that can have a quantifiable effect in a shorter time frame.

Small Watersheds

Many watershed projects in Iowa conduct monitoring efforts. The Iowa Water Quality Initiative supports 23 demonstration projects, helping prioritize areas and identify practices that reduce nutrient loss. The majority of projects include a monitoring program in order to inform, target, and prioritize practices and resources.

Large Watersheds

Iowa’s fixed-station network includes 60 monitoring sites throughout the state as of 2015. This area covers about 80% of the water leaving the state.

Paired Watersheds

Two ongoing projects in Iowa examine paired small watersheds, one of which is supported by WQI. In each project, one watershed receives targeted conservation practice implementation, while the other receives less program focus and remains status quo. Water monitoring at the outlet of each watershed is conducted with the goal of eventually detecting the collective impact of conservation practices.

Iowa Nutrient Research Center

The Iowa Nutrient Research Center at Iowa State University has funded 10 new projects related to water quality.

The Iowa Nutrient Research Center, established by the Board of Regents from legislation passed in 2013, responds to the need for continued research and innovation to address Iowa's water quality needs. The center addresses identified needs or gaps in nitrogen and phosphorus research of importance to Iowa in reducing the loss of nutrients to the environment. Its research is evaluating the performance of current and emerging in-field and edge-of-field practices, providing recommendations on implementing new or tested practices, and developing tools to help decision-making in adopting effective management practices. The center has funded more than 30 projects led by scientists at Iowa State University, the University of Iowa, and the University of Northern Iowa.

Below is a list of the awarded projects through the Nutrient Research Center in 2015:

- Improve the capacity to detect load reductions
- Potential monomethylmercury production in bioreactors and wetlands intercepting elevated nitrate loads in Iowa
- Impacts of prairie pothole hydrology on field scale losses of nitrogen and dissolved phosphorus
- Evaluate nutrient-processing capacity of roadside ditches
- Phosphorus contributions from eroding Iowa stream banks
- Woodchip bioreactors for improved water quality
- Establishment and monitoring of saturated buffers
- Land tenure and nutrient management practices: Identifying economic barriers and incentives for landowners and tenants to meet growing soil and water conservation needs
- Building cost-effective prairie for multiple nutrient reduction practices
- Evaluation of measurement methods as surrogates for tile-flow nitrate-n concentrations

More information on the projects and the researchers involved are listed on the center's web site: cals.iastate.edu/nutrientcenter/project. The site also includes previous projects and quarterly progress reports of each study.



Dr. Michelle Soupir discusses INRC-funded research on bioreactors with Gov. Branstad and Lt. Gov. Reynolds

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Iowa Leaders in Conservation

Since 1999, Des Moines Area Community College (DMACC) Agribusiness students have tackled real-world, day-to-day farm operations at their Dallas County farm. In the last few years, cover crops have been integrated into the operation. Farm Coordinator Travis Lautner shares the program's take on cover crops throughout the past year.



**DMACC Farm located in Dallas County
photo courtesy of DMACC**

"In the fall, we plant rye atop acres that we harvest as corn silage. The following spring, we chop and bag the rye for cattle feed. Since utilizing winter cover crops over the past several years, we've learned that the cover crop does not seem to inhibit the soybean yield. In fact, we experienced 2-3 bushel better soybeans on this particular field in 2015 compared to acres in the same field without rye cover crop. In addition, we tend to experience less weed pressure on these acres during the growing season. This particular field yielded 250 bushel corn the previous year, followed by a field average of 60-bushel soybeans the following cover crops. We suggest that our students start small and discover how cover crops can be implemented into their own operations."

Find out more about Iowa Leaders in Conservation at cleanwateriowa.org.

Point Source (Iowa DNR)



The point-source portion of the nutrient reduction strategy established a process to achieve significant reductions in the amounts of nitrogen and phosphorus discharged to Iowa's rivers and streams by the largest industrial and municipal wastewater treatment plants. Major point sources will be required to assess the feasibility and reality of reducing the amounts of nitrogen and phosphorus discharged to Iowa surface waters. Practices determined to be feasible and affordable will be required to be implemented.

The process is unique and innovative. In the traditional approach, limits are established in a permit and treatment facilities are constructed to meet those limits. In this approach, nutrient reduction facilities are constructed, sampling is performed and technology-based limits are developed using actual treatment plant performance data.

101 National Pollutant Discharge Elimination System permits have already been issued with provisions to implement the strategy with intent to issue 20 permits per year.

Several Publicly Owned Treatment Plants (POTWs) and industries have constructed or are presently constructing biological or chemical nutrient reduction facilities. Many others are planning to construct facilities in the coming years.

Find out more about Point Sources at cleanwateriowa.org.

Funding was approved in 2016 for the Des Moines Water Reclamation Authority (WRA) to install a phosphorus recovery process that is projected to result in a significant decrease in total phosphorus in the final effluent. Installation of this technology is scheduled to be completed in 2019 and is expected to remove approximately 365 tons or 730,000 lbs of phosphorus per year from the wastewater.



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Urban Conservation



IDALS began the Urban Conservation Program in 2008. The program provides technical assistance to communities in developing programs and specific projects to address stormwater runoff following well established criteria and procedures detailed in the Iowa Stormwater Management Manual.

IDALS and partners fund five Urban Conservationists in the State to serve as technical resources for communities and individuals interested in implementing storm water protection practices. In 2016, efforts built upon recent expansion in the urban conservation area. 13 new projects were funded through WQI for urban conservation demonstration projects:

- Amana Colonies Urban Conservation and Water Quality Education
- Ankeny: NE 36th St Sediment Basin and Stormwater Wetland Project
- Arnolds Park: Monument Drive Pervious Paver System
- Bloomfield: Green Streets Water Quality Project
- Cedar Rapids: Pilot Projects to Assist Future Larger Scale Implementation of Best Management Practices across the City's Public Infrastructure
- Coe College: Permeable Parking Demonstration
- Davenport: Agriculture Practices in an Urban Landscape
- Des Moines: Easter Lake Watershed Project Sediment Forebay and Stormwater Wetland
- Des Moines: Sustainable Iowa State Fair
- Lake View: Black Hawk Lake Urban Watershed Project
- Sioux City: Promenade Green Infrastructure Improvements
- Storm Lake: Restoring Storm Lake Water
- West Des Moines: Woodland Hills Park Water Quality Improvements



Biocell in Rockwell City

IDALS is in the process of selecting more Urban Demonstration projects with an anticipated funding announcement to be made in April of 2017.

FY2018 Funding Request

Iowa Secretary of Agriculture Bill Northey has requested \$9.6 million for the Iowa Water Quality Initiative as part of the Iowa Department of Agriculture and Land Stewardship's fiscal year 2018 budget and has also reiterated his support for the proposal passed by the Iowa House of Representatives last session that would have provided nearly \$500 million through 2029 for water quality efforts in the state. Additional funding would allow the Department to continue expand efforts to implement the Iowa Nutrient Reduction Strategy.

The Department received a total of \$9.6 million for the current fiscal year for the initiative to support conservation and water quality improvements in Iowa.

In addition to the projects detailed in this report, the Department has put into motion new initiatives that will leverage partner resources and increase the capacity to deliver conservation practices in the state. These initiatives include a focus on edge of field practices, streamside and in-field buffers, and demonstrating urban non-point-source practices. The funding requested for the Water Quality Initiative would allow the Department to continue and expand its work to address the quality of our streams and water resources in a scientific, reasonable, and cost effective manner.

As demonstrated in the first three years of the WQI, the Department is committed to leveraging state resources to expand the program and increase implementation of practices, including partnering with private and public institutions to quantify the results, and maximize the return on investment with state funding. Additional state funding will increase the leveraging power to bring in additional resources to increase the pace and scale of implementing the practices needed to meet the goals of the Iowa Nutrient Reduction Strategy.



*Construction of targeted wetland restoration in Wright County
photo courtesy of Bruce Voigts*

"We continue to see exciting progress as new farmers engage in water quality efforts and look at what they can do on their farm. Our focus through the Water Quality Initiative has always been on working collaboratively to get more practices on the ground that have been proven to help protect water quality. To date, more than 5,000 farmers have signed up to try water quality practices on their farms, and the Department has 45 demonstration projects – both rural and urban – in place across the state to help implement and demonstrate water quality practices. We are excited to have more than 100 organizations participating in these projects. We greatly appreciate the strong support we have received from the Governor's office and Legislature for the Water Quality Initiative and look forward to continuing to build on the momentum that has been generated," Northey said.

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