WORKING FOR CLEAN WATER

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2015 IOWA WATERSHED SUCCESSES

COVER
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WE ALL LIVE IN A WATERSHED

We all live in a watershed, an area of land that drains to a lake or stream. What we do on that land — whether it's a yard, farm, business or factory — affects the health of our lakes, streams and rivers.

It impacts our drinking water, recreation, economic development, fish and wildlife, and our quality of life. Clean water starts with us.

When water runs off the land, it can carry pollutants with it. Rainfall can send loads of exposed soil and nutrients from fields and bare ground into our waterways. Motor oil and other wastes can wash off driveways and lawns and into storm sewers, which dump directly into a lake or stream without treatment. If we don't make changes to the way we manage the land to keep soil, nutrients and other materials where they belong, they'll end up in our water.

We want to keep our rich Iowa topsoil on the land, not just because of its value to farming, but because of how it impacts our water and aquatic life. Excess sediment clouds the water, making it difficult for sight-feeding fish to see. It can smother fish eggs and mussel habitat. Nutrients often attach to sediment or come into our waters through runoff or tile drainage. Too many nutrients in our water lead to algal blooms, which can affect oxygen levels for aquatic life. Excessive nitrogen and phosphorus from Iowa and the Mississippi River basin have created a "dead zone" in the Gulf of Mexico, an area devoid of aquatic life.

However, we have many ways to address these problems on rural and urban lands. Farmers and rural landowners can change how they manage cropland, livestock facilities and other lands to slow and filter runoff or even prevent it. There are many ways to conserve our soil and slow and filter the runoff entering our lakes and streams.

Urban residents can use rain gardens, native landscaping and more to treat the rain and snow that falls on their yards. Cities and businesses can make changes to how they handle wastewater and stormwater.

While what we do individually makes a difference, coming together as a community can make a large impact. In Iowa, water quality improvement is built on a solid foundation of traditional conservation approaches based on watershed and community research and brought to life through strong partnerships.

With renewed interest in our waters comes many benefits for our communities. Better water often translates into a better quality of life for residents. Kids have cleaner water to swim and play in. Drinking water treatment costs can go down and the impact of flooding may decrease. Hunters notice improved wildlife habitat. Economic development picks up as tourists come to town to investigate the improved fishing or to put in the kayak.

Future efforts to protect our lakes, rivers and streams will grow upon today's innovative efforts. By taking a strategic approach — identifying waterbodies most in need of help and developing and implementing watershed management plans to solve problems — Iowans can continue to make a difference in their water quality.

Ledges State Park near Boone.

IT'S A PARTNERSHIP EFFORT

PARTNER GROUP INITIALS:

Iowa Department of Natural Resources (DNR)

Iowa Department of Agriculture and Land Stewardship (IDALS)

County Conservation Board (CCB)

Soil and Water Conservation District (SWCD)

Watershed Management Authority (WMA)

U.S. Fish and Wildlife Service (USFWS)

U.S. Department of Agriculture (USDA)

USDA Farm Services Agency (USDA-FSA)

USDA Natural Resources Conservation Service (USDA-NRCS)

U.S. Environmental Protection Agency (EPA)

Resource Enhancement and Protection (REAP)

Watershed Improvement Review Board (WIRB)

Conservation Reserve Program (CRP)

Iowa State University (ISU)

Iowa Department of Transportation (DOT)

Resource Conservation and Development (RC&D)

The most successful water quality improvement efforts are led by groups and communities partnering with organizations like the DNR to put together and implement comprehensive, long-term plans to improve the land and water. A group can pool resources, generate new ideas and raise awareness and support to strengthen how Iowans value our waters and to make actual changes in water quality.

The DNR has approved watershed management plans for 24 watersheds in Iowa, opening up funding opportunities to help those groups put their plans in action. Since 2009, the DNR has awarded $617,904 in grant funding to help Iowans gather information and create plans to improve their water quality. In addition, the DNR has helped create 14 watershed management authorities in the state.

However, most projects need additional funding to reach their goals. It also takes more than funding to make watershed improvement happen. It takes the knowledge, labor, energy and passion of many different individuals, agencies, organizations, businesses and other groups.

As watershed groups move to put their management plans into practice, they're working with Pheasants Forever, Trout Unlimited, Ducks Unlimited, the Iowa Soybean Association and other groups interested in conserving our natural resources. They draw on the expertise of county conservation boards, soil and water conservation districts, the DNR, the Iowa Department of Agriculture and Land Stewardship, the USDA Natural Resources Conservation Service and other agencies. Friends groups and other community organizations spread the word and help raise additional funds.

"Sound planning is the foundation of any successful effort, but it takes the resources and knowledge of many partners to make it happen," says Allen Bonini with the DNR's Watershed Improvement Program. "Plans support long-term efforts and strategies to improve our water and keep it clean. Each year, we're excited to see groups' progress as we help them implement sound watershed management plans. The successes keep coming."

Local partnerships are critical for improving water quality.

Conservation practices help soak up and filter runoff at Coralville's Iowa River Landing, a green infrastructure development.

CORALVILLE MAKES GREEN STRIDES

CORALVILLE

PROJECT PARTNERS

City of Coralville

Coralville residents

Johnson County SWCD

WIRB

IDALS

Iowa DNR

State Revolving Fund

Generally, Coralville Lake, just upstream from its namesake town, does its job as a flood control reservoir. But the lake was no match for the floods of 1993 and 2008, creating millions of dollars in damages for the eastern Iowa town.

Following the destruction of the 2008 flood, the city began investigating stormwater practices that would help reduce runoff and better filter it to remove urban pollutants. That work has included bioswales, permeable paving and some green roofs – one easily seen from Interstate 80. City road crews now use a mix of beet juice and salt to de-ice roads. As the city expands Coral Ridge Avenue from two lanes to four, grant funds from the Watershed Improvement Review Board and Rockwell Collins will help install native plants in bioretention cells, both in the median and along the shoulders, to catch runoff along the busy road. The Coral Ridge Avenue biocells should handle a 2.3-inch rain event at a cost that Coralville stormwater coordinator Amy Foster estimates to be similar to traditional storm sewer infrastructure.

That goes well beyond the city's new post-construction stormwater ordinance, which requires all new development or redevelopment to absorb a 1.25-inch rainfall event. Foster says statistics suggest that in the next 20 years, about 50 percent of development will be redevelopment. "That gives us a second chance to do it right," she says.

That's something that resonates well in Coralville. The city encourages its residents to join the effort by offering matching grants to use practices that slow and reduce runoff to the city's storm sewer system, which also helps improve water quality in Clear Creek and the Iowa River. That can include rain gardens, bioretention swales, rain barrels, pervious paving, soil quality restoration and more. Last year, the city gave out $25,000 in cost-share funding for these practices, and the city council upped the amount available to $30,000 for the coming fiscal year. "It's been really popular. They really love that program," says Foster of residents. "People see this as not only necessary, but their responsibility as a good neighbor."

While small practices like these may not prevent a catastrophic flood like in 1993 or 2008, it can help on a day-to-day basis and reduce localized flooding. Mayor John Lundell installed a pervious driveway at his home, and monitoring done there by the University of Iowa has shown that it's reducing peak stormwater flows. In the last year, the driveway hasn't discharged any water via its overflow tile to the storm sewer, soaking in all runoff. "It's infiltrating a lot more water than we thought," says Foster. Green practices also offer a cost-efficient option in older areas of town. "We have a lot of opportunity to implement green infrastructure into older neighborhoods that have limited storm sewers," Foster says.

A number of biocells, pervious paving and rain gardens will soon go in at private sites in Coralville, with construction of practices overseen by the Johnson Soil and Water Conservation District. The city will also continue working on practices at the new Iowa River Landing, a green infrastructure development, as well as in the right of way along Fifth Street. There, native turf and tree infiltration boxes will help reduce runoff to the storm sewers.

Mayor John Lundell converted his driveway to pervious pavers.

Lake Darling near Brighton shines again following a four-year, $12 million renovation of the lake and park.

LAKE DARLING TAKES SPOTLIGHT AGAIN

BRIGHTON

PROJECT PARTNERS

Iowa DNR
IDALS
USDA-NRCS
Washington SWCD
Keokuk SWCD
Jefferson SWCD
U.S. EPA Section 319
Friends of Lake Darling
Landowners
Washington County
Jefferson County
Geode RC&D
Sheldon Foundation
Izaak Walton League
Washington County Riverboat Foundation
Jerry B. Robinson

On the same September day 64 years earlier, legendary conservationist and Iowan Jay "Ding" Darling ceremoniously "set the gate" on the then newest and largest artificial lake in Iowa, Lake Darling.

But this September 2014 gathering was more than an observation of an anniversary. It was a celebration of the rebirth of Lake Darling State Park, a triumph for the local community. A showpiece for years, the lake's too-large 12,500-acre watershed spanning Washington, Keokuk and Jefferson counties produced ongoing siltation, nutrient and bacteria issues in the lake. Fishing suffered. Boaters and swimmers went elsewhere. "In the spring, the lake was the same color as hot chocolate," says Don Kline, a former DNR fisheries biologist who tested the lake's water clarity monthly from 1978 to his retirement.

The 305-acre lake shrank to 267 acres. Something needed to change — and the community took action. Local landowners worked together and made changes on their land. Through a watershed project, they installed 162 conservation practices, from ponds and basins to terraces and soil-holding grasses, many stretching across property lines. The practices slow water and filter out silt, nutrients and bacteria before they can reach the lake. With additional conservation work on state land, the practices have reduced the amount of sediment reaching the lake by 60 percent. "Without landowners, we would not have any of this done," commented watershed coordinator Stan Simmons at the rededication ceremony. "Everything that happens up here is on land. It is owners cooperating with each other. Problems did not start at line fences. They did not stop at line fences. Many times, landowners had to work together to get problems solved. And we were very successful, in most instances."

Recognizing the work done in the watershed to protect the lake, the DNR went to work on a four-year, $12 million renovation of the lake and park. The lake was drained, the dam replaced and the lake level restored to 305 acres. The silt trucked out from the lake would cover a football field 12 stories high — the loss of precious topsoil that the lake's namesake worked so hard to conserve in the 1920s and 1930s.

New boat ramps, fishing jetties, piers and an accessible fishing trail welcome anglers as they cruise into the park on new roads. There's an all-new campground, shelters, water lines, even new sand on the beach. And then there's the lodge — comparatively the senior at seven years old, built through impressive fundraising by the Friends of Lake Darling. "Everything is new, except the ground it is built on," jokes DNR fisheries technician Vance Polton.

And they're not done. The Friends of Lake Darling are at work raising funds for three new all-season cabins and for connecting park trails to nearby Brighton. They'll see a big payoff, too — it's estimated the work to return Darling to its showplace status will bring in an annual $8.7 million economic benefit to nearby communities, plus quality of life benefits, too.

"Lake Darling is back," said DNR fisheries biologist Chad Dolan to the supporters gathered. "It surely would not have happened without you."

Enjoying the new fishing trail at a renovated Lake Darling State Park.

Prairie plantings are just one of many practices on Rick Juchems' farm near Plainfield.

EDUCATION LEADS TO ACTION

STATEWIDE

PROJECT PARTNERS

Iowa DNR

ISU Extension and Outreach

IDALS

USDA-NRCS

Leopold Center for Sustainable Agriculture

Iowa Water Center

Iowa Learning Farms

Conservation Districts of Iowa

Iowa Farm Bureau

Practical Farmers of Iowa

U.S. EPA Section 319

"I'm one of many trying to do the right thing, and we just try to do what we can," says farmer Rick Juchems. "I don't know that it's my job, but I do it anyway."

With any cooperative program, partners like Juchems are important. Feeling a personal obligation to protect and improve his land for future generations, Juchems hopes to pass his land near Plainfield to his two children someday. That's made him a vocal leader and advocate in multiple local, regional, and national conservation organizations. "There's a finite number of acres that are farmable and that number keeps dwindling every year," he says, "so each acre gets more important as you go."

Juchems became involved with Iowa Learning Farms as a cooperator for a cover crop study in 2004, and has been an advocate for the organization ever since, working with ILF coordinators and partners to encourage use of conservation practices.

ILF has been working across the state through funding, field days, and educational outreach programs for just over a decade. "We're discovering that there aren't as many scientific barriers to conservation practices as there are social ones," says ILF program manager Matt Helmers. "Most farmers don't want to be the only one in their county using these practices."

Currently, even practices like cover crops are only used on about 1.5 percent of Iowa row crop land. Still, Juchems isn't the only farmer embracing conservation with gusto — and he's constantly working to encourage more neighbors and landowners to implement more conservation practices. "I got [my neighbor] talked into putting in a CRP waterway filter strip," Juchems says.

ILF program director Jacqueline Comito describes Juchems an ideal partner because of his willingness to speak out and show off the practices he advocates on his own land. "Hearing that [conservation practices] really work sounds a lot more credible coming from another farmer," Comito says. "Our field days give the opportunity for farmers, landowners, and community members to see conservation on similar soils to their own and the benefits it has on the surrounding area."

Comito and Helmers say that ILF programs and partners have had a significant effect on conservation in Iowa so far, but note that there is always room to grow.

"We're being forced to turn down almost a third of the requests we have for field days due to time and staff constraints," Comito says. "While we definitely want to reach everyone, the fact that the demand is there makes it pretty clear to me that we're doing something right."

That's a feeling Juchems shares. His daughter, Elizabeth, started working with the Leopold Center for Sustainable Agriculture and ILF while she attended Iowa State University, and now she serves as an event coordinator. Rick says he's proud that she chose to enter conservation of her own accord, and that she and others are continuing to do work that will be important for Iowa communities in the future.

Rick Juchems advocates for conservation work among other farmers.

Work at Little Storm Lake has improved water quality and wildlife habitat.

RETURN TO GLORY DAYS AT LITTLE STORM

STORM LAKE

PROJECT PARTNERS

Iowa DNR

Storm Lake Preservation Association

Lake Improvement Commission

Ducks Unlimited

City of Storm Lake

City of Lakeside

Buena Vista County

WIRB

Buena Vista University

Longtime Storm Lake Mayor Jon Kruse remembers the glory days of waterfowl hunting in Little Storm Lake during the 1960s and'70s, but by the early '80s the ducks were gone. The marsh became a silt-filled carp nursery with little vegetation.

Once, the marsh supported waterfowl hunting, fishing and other recreation, including a boat livery and beach. But over the years, sediment from surrounding fields created silt plumes that flushed into the main lake during heavy rains, hidden by cloudy lake water. Then two events in 2002 set the marsh on a new course. First, the DNR and Lake Improvement Commission began dredging the main lake and second, Little Storm Lake was identified as a marsh in need of fixing. It wasn't long after the water quality began to improve when it became evident just how much silt was entering the lake. About 70 percent of the water entering Storm Lake from its 54-1 watershed-to-lake acreage ratio is delivered by Powell Creek via Little Storm Lake marsh — and Little Storm Lake was not functioning like a healthy marsh. "Silt plumes were stretching halfway across the lake. It was really apparent after we started cleaning up the big lake," says Kruse. "It was evident how much silt we were putting into the lake."

The Storm Lake Preservation Association developed a marsh restoration proposal, helping it secure funding from WIRB and DNR. In 2008, the City of Storm Lake pledged its support, Ducks Unlimited signed on to provide engineering and design work for the marsh, with the Storm Lake Improvement Commission, Lakeside, Storm Lake Preservation Association and the DNR contributing to the effort, too. The group wanted to address the potential impact of backing water onto neighboring properties. "We (DNR) have a very limited footprint in the area and a flat landscape," says Julie Sievers with the Iowa DNR's Storm Lake office. "We have the Lake Creek Country Club and homeowners association in the watershed and two private landowners on either side that we needed to factor into the plans."

The marsh redesign needed to slow water moving through the system with a way to bypass the marsh if necessary. Step one was to separate the marsh from the lake and Powell Creek by building a 4,000 foot dike with the ability to direct the creek water through a winding channel designed to slow its movement, enter the marsh, return to Powell Creek and finally Storm Lake – free from silt and nutrients. Barriers were added to prevent carp from accessing the marsh. Slowing water allows silt particles to separate from the water, where vegetation can use the nutrients trapped in the silt. But designers needed flexibility to get water out of the marsh quickly. A pump sends water to a new sediment basin, where it slowly trickles through vegetation and back to Powell Creek before entering the lake. In flood events, the dike was designed to be overtopped to protect its integrity. "This system was designed to allow periodic draw downs that will solidify sediment and promote emergent and submergent vegetation and kill any carp that got in to the marsh," says Pete Hildreth, southwest Iowa supervisor for the DNR's Wildlife Bureau.

Construction began in 2010. In 2012, the pump was turned on to dewater the marsh. In 2013, an 11-inch rain over Memorial Day Weekend sent water over the dike, but caused only minimal damage, just as designed. Little Storm Lake is now ringed with 7-foot-tall cattails and serves as a teaching tool to local students, thanks in part to students at Buena Vista University who placed a series of educational panels along a trail and floating dock extending into the marsh. Improving water quality was the driving factor, but it also created excellent waterfowl habitat. On just one spring day, Kruse saw 12 waterfowl species along with kayakers, wildlife watchers, walkers and bikers using the area.

Julie Sievers and Pete Hildreth, DNR, discuss plans with City Manager Jim Patrick.

Dick Sloan's conservation ethic – much of it inherited from his father – is combined with a natural curiosity and a willingness to learn from trying new methods and approaches to farming.

A HOMEGROWN CONSERVATION ETHIC

BRANDON

PROJECT PARTNERS

Dick Sloan

Lime Creek Watershed Improvement Association

Practical Farmers of Iowa

ISU Extension and Outreach

Cedar River Watershed Coalition

Buchanan SWCD

Iowa Learning Farms

IDALS

USDA-NRCS

USDA

Iowa DNR

As a kid, Dick Sloan admits that he enjoyed playing in the creek. Now, some five decades later, his "playground" is the dirt of the 700 acres he farms near Brandon in Buchanan County.

While the wide array of conservation efforts Sloan has established in his farming operation revolve around the concept of protecting and enhancing soil health, dividends are being found in improving water quality as well. It's evident in the Lime Creek watershed, close to home, and on a larger scale in the Cedar River watershed by reducing erosion and retaining nutrients.

Sloan's conservation ethic — much of it inherited from his father — is combined with a natural curiosity and a willingness to learn from trying new methods and approaches to farming. Sloan, a college biology major, has always been fascinated by the natural systems around him, even in farming where so much of the natural conditions have been altered to facilitate modern agriculture. For Sloan, conservation efforts have produced a natural cause-and-effect equation he can appreciate: more microbes in the soil equals more worms, which equals more wildlife, such as birds.

One of the first big converts to cover crops such as winter wheat, cereal rye and winter barley on fields, Sloan has incorporated myriad conservation efforts on his farm, ranging from no-till to terraces to prairie strips. The prairie strips, used as buffers, provide deep-rooted filters to improve water quality and provide crucial habitat for pollinators. Sloan also has a field where water quality is monitored from a tile line, a controlled system that he particularly likes. "It's on 40 acres so I can keep track of exactly what I did on that field," Sloan explains.

Sloan's farming operation has literally become a classroom featuring various conservation practices. He has hosted a number of field days to showcase options available for farmers to enhance soil health. He leads the Lime Creek Watershed Improvement Association. But perhaps the biggest lesson of all is that profit does not have to be the sacrificial lamb to adopting conservation practices that protect soil and water quality.

"Dick is very much a leader in showing how conservation can be part of a successful farming operation," says Mary Beth Stevenson, Iowa-Cedar River Basin coordinator. "He's not pushy, he simply explains his experiences. With Dick, it's very much a problem solving approach that is particularly effective with farmers," says Stevenson. She says Sloan's credibility is not uniquely tied to success. "Dick is not afraid to try new things and he will also report about the things he tried that didn't work out," says Stevenson.

Sloan says the key to wider adoption of conservation practices in agriculture revolve around promoting soil health and fertility. After years of incorporating conservation practices such as no-till and cover crops into his operation, Sloan is convinced that he chose the right path. "To me, it's all about keeping a layer of organic matter on the field. I want it to act more like a sponge. I think some farmers are afraid of residue but I think that tillage can cause the soil to seal over quicker and create more runoff. I like the idea of recycling nutrients," says Sloan.

Dick Sloan has never forgotten some of the important lessons he learned playing in the creek as a kid. Now he is passing along lessons on protecting soil that also protect the water quality in the creek. "I want the experience of playing in the creek like I had to be available to kids in the future," says Sloan.

Sloan has used myriad conservation efforts on his Brandon farm.

Wash water collected at DOT truck washes is filtered to remove oil and grit, then mixed with salt to create brine for treating roads in winter driving conditions.

RECYCLED WATER PROTECTS STREAMS, ROADS

STATEWIDE

PROJECT PARTNERS

Iowa DOT

Iowa DNR

During cold and snowy Iowa winters, salt is a must to keep cars on the road. A new approach protects streams and creates a new product to help drivers make a safe trip.

While salt has long been a go-to for winter roads, the amount of salt put down should be carefully considered to prevent damaging local ecosystems and the undercarriages of vehicles. "Until recently in the U.S., people didn't see any downsides to road salt because they thought of it solely from a public safety perspective," says IOWATER and DNR stream monitoring coordinator Mary Skopec. "But freshwater aquatic species can't survive in overly salty water, so limiting salt runoff is really important to prevent things like fish kills."

In an effort to reduce the salt reaching Iowa's waters, Iowa Department of Transportation truck washes across the state now collect the salty wash water from cleaning trucks, and either process or recycle it to make a salty brine to treat roads during Iowa's often tough winter driving conditions. "Working with DOT to help limit salt in of Iowa's waterways not only makes them more healthy right now, but also for years to come," says DNR water quality coordinator Adam Schnieders. "While salt is still applied and a necessity, the environmental impacts are more diffuse as it's spread across the landscape and not concentrated and washed out of these wash facilities directly to Iowa's waters."

The DOT revamped its Ames truck wash for wash water recycling first. The heated floor slants toward two drains that collect wash water. From there, water runs through an interceptor to remove dirt and oil, and then is mixed with more salt and pumped into brine holding tanks. About half of the space in the indoor wash is devoted to eight of these light blue holding tanks, capable of holding 8,000 gallons apiece. Altogether, that's enough water to fill more than 600 bathtubs, but it goes fast.

"We go through a lot more brine than what our wastewater makes," says James Van Sickle. "It sure looks like a lot, but you've got to think of that spread out over all the roads we take care of." Van Sickle has been working at the Ames facility for 38 years, and says he's seen a lot of positive changes in that time.

"Over the last few years we've been a lot more conscious about our waste and environmental effects," says Mary Kay Solberg, senior environmental specialist with the DOT. "I think we did [the facility changes] about as fast as we possibly could."

When the project started in 2008, the DOT applied about 300,000 tons of salt over the rough winter. Since then, applications have steadily declined due to improved methods like brine and more typical winter weather, resulting in the DOT using less than half of the 2008 amount in 2015.

"We try to help everybody drive as safe as possible, but how you do that has got to change when new information comes out," Van Sickle says. "Using the wash water isn't as hard on the environment or people's vehicles, and in the long run it even saves us money on materials. Building facilities and starting these things is expensive, but I think it makes a difference."

James Van Sickle has worked at the Iowa DOT Ames facility for 38 years.

Water Rocks! staff lead students at Mediapolis High School in a game that shows how all organisms in an ecosystem depend on each other. Photo courtesy of Water Rocks!

WATER ROCKS! INSPIRES NEXT GENERATION

STATEWIDE

PROJECT PARTNERS

Iowa DNR

ISU Extension and Outreach

Iowa Learning Farms

Leopold Center for Sustainable Agriculture

U.S. EPA Section 319

Water Rocks!

It's been over a year, and Elisha Kubalsky's middle school students still talk about wetlands bingo.

Then there's wetland hopscotch, role playing techniques, live demonstrations — all part of a total participation approach that's really brought home water quality lessons. "Seeing this high level of engagement is the most effective," says Kubalsky, the entire middle school science department at John F. Kennedy Catholic School in Davenport. "It's more meaningful and memorable for them."

Those activities came from the Water Rocks! program, which works directly with teachers across the state to educate Iowa's students about water quality issues and to inspire a greater appreciation of Iowa's waters. Using classroom visits, songs, music videos, hands-on activities and an interactive website, Water Rocks! teaches kids about water, natural resources and agriculture using science, math, engineering and arts-based approaches. In 2015 alone, the program spoke to more than 19,000 people and participated in 139 outreach events.

A former colleague suggested Kubalsky attend the Water Rocks! teacher summit at Iowa State University, where she took in presentations on water, hydrology, soil conservation and more from ISU faculty, and she went home with a free kit of modules and presentations to use in her own classroom. The science and education research-based methods used to create the modules resonated with Kubalsky. "It's sound science and sound teaching," she says.

The modules, adaptable for each grade level, allowed her students to interact with the regular classroom material in a new way. "We live in one of the world's largest watersheds and next to one of the world's largest rivers here in Davenport, but we don't always understand and appreciate water as a resource," Kubalsky says. Using Water Rocks! modules in her classroom and bringing in the Conservation Station to demonstrate the effects of rainfall on different surfaces has made an impact on her students. "Most students live in town and don't have on-farm experience, so it's important to gain experience with the importance of soil and visually see what happens to water as it travels over surfaces," she says.

Some students have volunteered in the river cleanups along the Mississippi River as well. "We know Iowa's youth are the next generation of decision makers, so we want to work with them to create an awareness and care for our water resources, so they'll be prepared to make decisions in the future," says Allen Bonini with the DNR, a partner in Water Rocks!.

Water Rocks! holds its annual teacher summit, provides resources to teachers and visits classrooms at no charge. Modules and other resources are available at waterrocks.org. "Teachers have responded really positively to the materials. We know our hands-on activities work because they have been tested in classrooms and used with thousands of youth," says Jacqueline Comito, who heads up the Water Rocks! effort. "My personal goal is to help every young person know and understand what a watershed is and why that is important, to more fully understand the consequences of their personal and societal choices on our water."

Students at John F. Kennedy Catholic School in Davenport learn about water quality from a Conservation Station demonstration. Photo courtesy of the school.

Lin Sorensen and her pet therapy dog, Noble, watch an aerial seeding of cover crops of her farm land in Wright County. Photo by Bruce Voigts.

WOMEN WORK TO PROTECT THE LAND

STATEWIDE

PROJECT PARTNERS

Landowners

County SWCDs

USDA-NRCS

IDALS

Iowa DNR

Women, Food and Agriculture Network

Iowa Soybean Association

Despite owning or co-owning more than half the land, women landowners and farm operators have been practically invisible in national ag statistics.

"No one counts them, except in Iowa," says Jean Eells, researcher and women's ag curriculum developer. Largely a result of data using only one owner's name, national data downplays women's efforts, despite more than half of Iowa women landowners adding conservation work after attending workshops designed for them.

Take Lin Sorensen of Des Moines, who inherited relatively flat, tiled Wright County land in 2006. As an absentee owner, she chose an active role over leaving decisions to her tenant. "No one has the motivation to take care of the land like the owner," she says. She recommends anyone left in charge of a farm should learn all they can through classes and from experienced farmers at field days, hire a farm lawyer to help find a tenant, and to write and negotiate lease terms, if needed. "Write conservation into your lease and go to the field," Sorensen says. For Kristi Heffelmeier, farming is a second career. "I never imagined I would want to move back to a small town or be a farmer," she says. After 20 years away teaching art in Texas, there was much to learn when she rejoined the family farm operation near Waterloo. She admires her dad, Chris Foss, and the operation he's built. Often the only woman at a meeting, Heffelmeier is not afraid to ask questions to gain understanding.

Although they have different perspectives, understanding farming methods shapes each woman's approach to soil and water quality. For Sorensen, conservation ties with her passion for animals. Founder and director of St. Francis Foundation for Pets, she's on a mission to protect companion animals and educate prosecutors on the proven link between violence against people and cruelty to animals. A field day convinced Sorensen no-till was the best way to reduce input costs and improve soil health. After three interviews, she signed a flexible conservation lease with no-tiller Kevin Burres of Eagle Grove that ties rent to commodity prices. In contrast, Heffelmeier and her dad farm 1,900 acres in three counties, including their fifth-generation farm. They use traditional practices like terraces, grassed waterways, strip-till and no-till. "My dad's an innovator and is willing to try new things, she says." Trying cover crops to reduce nitrate runoff in the Cedar River watershed was a natural extension of being good stewards. As part of the Miller Creek Watershed Project, Shane Wulf of Black Hawk SWCD monitors nitrates above and below their field. In 2014, the father-daughter team seeded cereal rye and radish just before Labor Day, dropping spring 2015 nitrates by half. Cost-share is critical. "It's a little scary. We have little control over the price of corn and beans, equipment or fuel costs, or the weather," Heffelmeier says. "Cost-share is so important while we learn how to be successful."

For Sorensen, benefits outweigh cost share: increased soil organic matter, greater permeability, fewer pests and diseases, better water quality. She worked with Wright SWCD to aerially seed a 90-10 oats and radish cover crop. She and Noble, her German shepherd, hand-seeded 18 acres two years ago and 36 this fall, giving her an intimate look at the fields. "Even though she is 90 miles from her farm, she walks her whole farm-ground twice a year," says Bruce Voigts, Eagle Creek and Boone River nutrient reduction strategy coordinator. "It reminds me of the conservation saying, 'the best conservation practice is the landowners' footprints on their ground.'"

Heffelmeier and her dad take a high-tech approach. "Everything we do is with GPS on the computer, like getting a prescription for fertilizer and seed. We vary seed and fertilizer rates with field conditions, putting more on areas where the crops will do well and less on areas where they won't." Like her dad, she'll try new ideas. A new service may help pinpoint times to sample soil and apply fertilizer. Next spring, they'll add a bioreactor to reduce nutrient runoff. "The more we can do and the more knowledge we can share, the better it is," she says.

Chris Foss and daughter Kristi Heffelmeier run a family farm together. Photo courtesy of the family.

Family fishing at Lake Ahquabi in Warren County.

TAKE THE NEXT STEP

We're with you every step of the way. When Iowans come together in their communities with the common goal of improving their lake, stream or river, the DNR and our partners can help you take action.

Local groups can receive technical assistance and guidance to create a Watershed Management Plan. The plan assesses the watershed for problems, develops solutions and involves your community in the effort. The plan, much like a road map, moves you toward success and helps you get back on track if detours pop up along the way.

Once you have a plan, you need to put it in action. DNR can help you identify available grant fund opportunities to get you started. Use these grants to help you launch your plan, making changes on the land to improve the water. DNR staff can continue to provide technical and outreach assistance, and guidance along the way. Our partners, IDALS and USDA-NRCS, also offer additional financial and technical assistance.

For more information about DNR Watershed Improvement:
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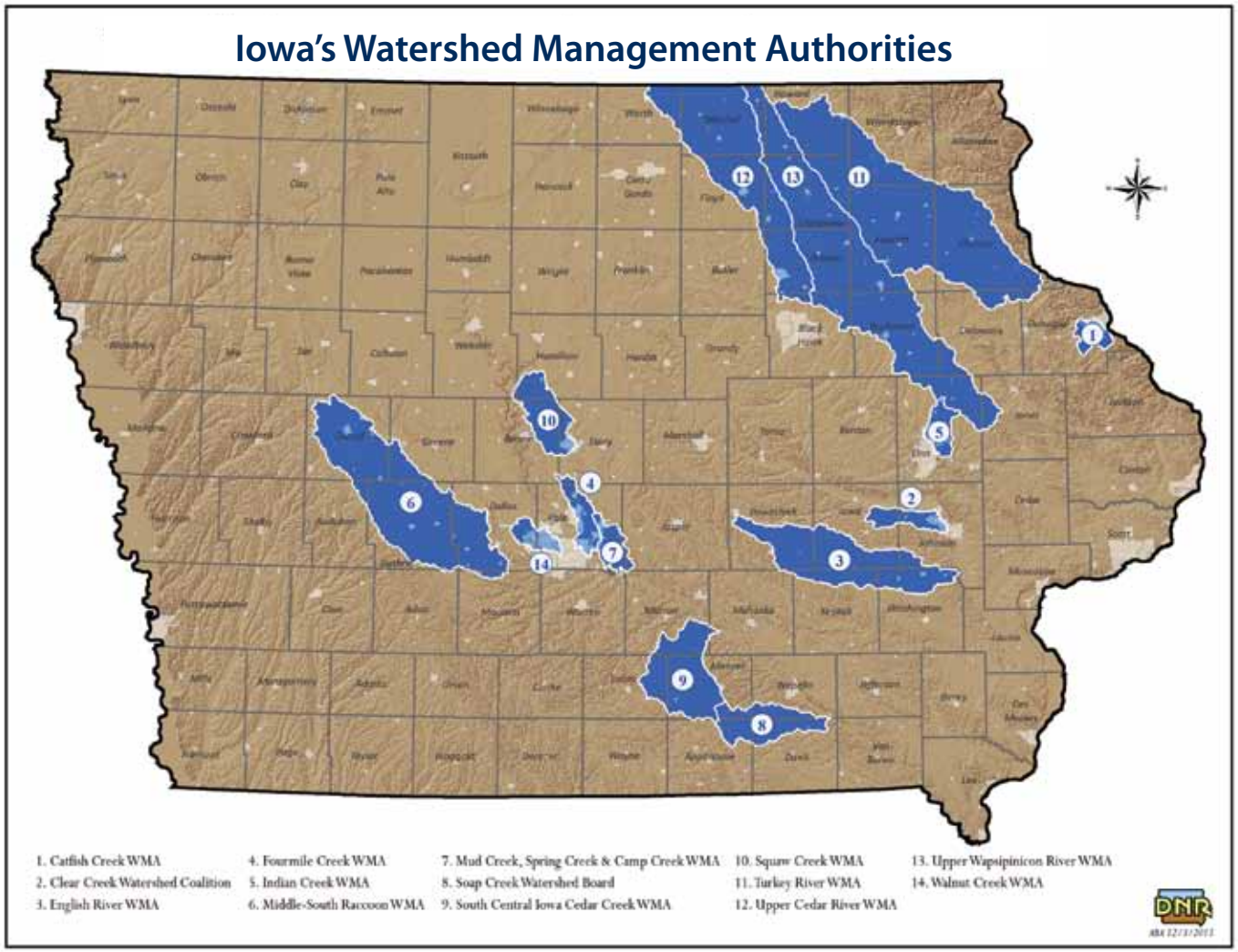
www.iowadnr.gov/watershed



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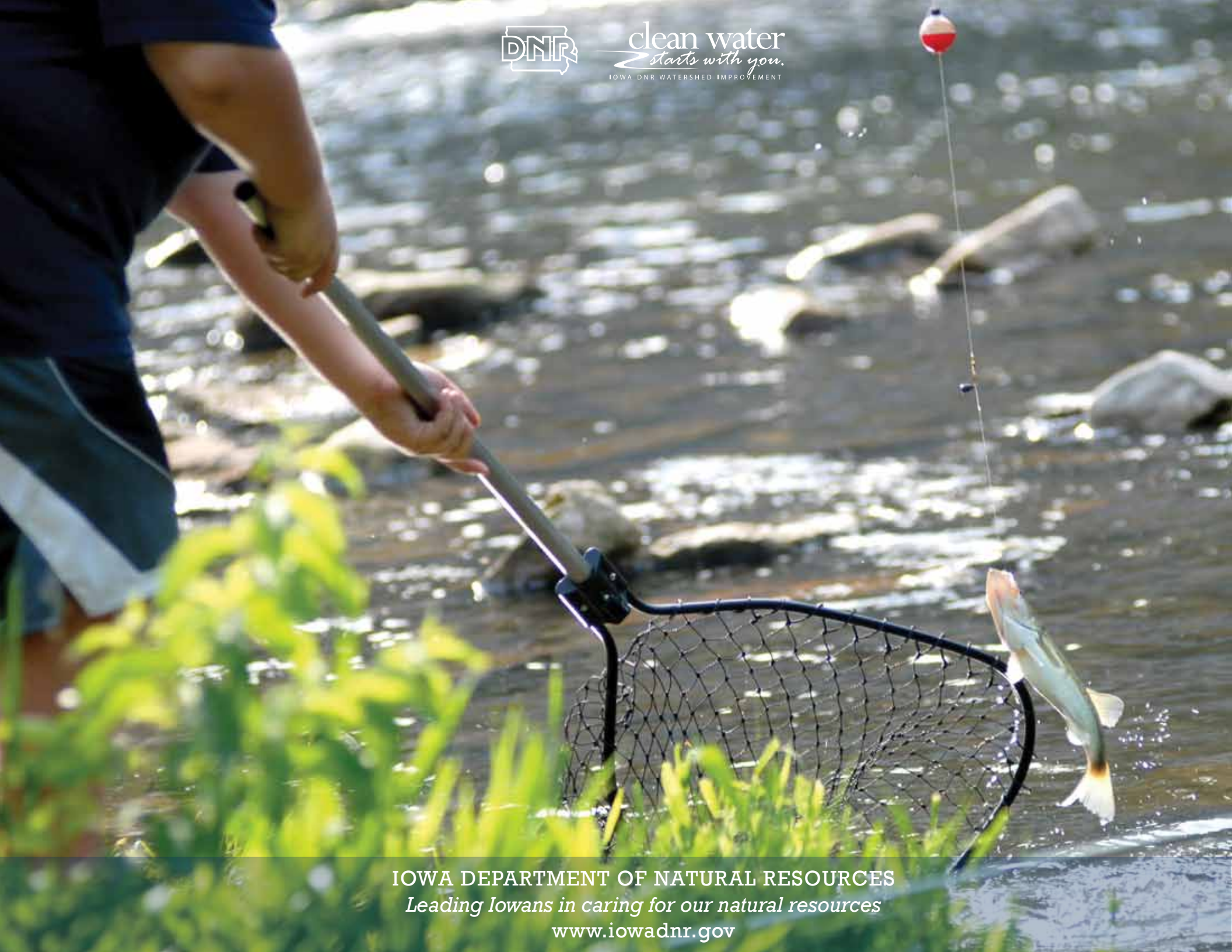

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