Clean Water Starts With Us

WATERSHED IMPROVEMENT IN IOWA DNR ◆ DSC ◆ NRCS SUMMER 2014

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clean water starts with you.

Social assessments create solid foundation

While watershed efforts aim to raise awareness of water quality issues, projects go nowhere if people don't change their behaviors.

"We know it takes a long time to show results in water quality," said Linda Prokopy, associate professor of natrural resource planning at Purdue University. "But we're really trying to change people and what they do. You can see quicker, measurable changes in behaviors."

To increase participation, it's key to understand the community, create incentives and motivate people to take action.

Public outreach efforts are most effective when they are based on what is known about the audience, planned ahead of time, and evaluated and refined for future efforts.

"Groups that do baseline assessments can streamline their education and outreach," said Prokopy.

For example, one project planned a large campaign to educate about problems from leaking septic tanks. However, the assessment showed the community knew leaking septics were bad; they just lacked resources to make changes.

"They would have spent time and energy telling people something they already know," Prokopy said.

Assessing potential audiences as a project begins helps to learn about their knowledge on water quality issues, their opinions, their motivations and barriers on conservation, how they receive news and more.

While social assessments can include a number of methodologies, like focus groups, many groups choose surveys.

"We wanted to get an idea of what kind of support we could expect," said Ross Evelsizer with the Turkey River Watershed Management Authority. "It's vital to have input from the people

that will make things happen."

The Turkey River group developed its survey in-house, using input from soil and water conservation districts and others who had conducted similar surveys.

Using county parcel data, Evelsizer mailed the survey to a random sample that included 1,000 rural landowners and 500 urban residents. The survey asked about knowledge of flooding and water quality issues,

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Give us your feedback! Take our readership survey

We want to hear what our readers think about *Clean Water Starts With Us.* Please take a few minutes to fill out our short online survey so we can learn more about what our readers are looking for.

Let us know your feedback on how you use information from the newsletter and what kinds of stories you'd like to see in the future.

Take the survey at https://www.surveymonkey.com/s/2VT7DJ7

Efforts take on social scientific research to bolster projects

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how people receive information, where water goes from a person's land and willingness to use conservation practices.

"The thing we refer to the most is that two-thirds of people that responded would do something on their land," Evelsizer said. "But the open-ended comments gave us an idea of the different levels of understanding and we definitely want to ramp up education and outreach efforts to get people up to speed on watershed issues."

While social assessment research can be hired out, projects choosing to develop an assessment themselves can use the free Social Indicators Data Management and Analysis, or SIDMA, tool available at http://www.iwr.msu.edu/sidma.

Prokopy, who works with the SIDMA tool, said it walks people through the process of creating a survey and offers a number of tested questions.

"Together with the handbook, it takes a lot of guesswork out of creating a survey and analyzing results," Prokopy said.

Jody Bailey and the English River Watershed Management Authority used the SIDMA tool and several other sources, like the Iowa Farm and Rural Life Poll, for inspiration to develop its survey.

"We feel like not a lot is known about this watershed," Bailey said. "What do landowners want? What do they know? Knowing this will help us move forward. We can focus on what works for them and how we can help."

Bailey sent a postcard to 680 randomly sampled rural and urban households in June with a link pointing to an online survey. A mailed survey will follow to those who don't respond online. One last reminder postcard will be sent to those who did not respond to either. Bailey chose the online option for convenience, but recognizes that mailed paper copies tend to have a higher response rate.

The English River WMA aims to learn people's level of knowledge on water issues, how they use the river recreationally, how land is used, attitudes about water policies, the impact of flooding and more.

"Understanding their attitudes and perceptions really helps us prioritize," Bailey said. "If we see trends emerge, that's an indication that we need to bring a lot more programming."

Using a social assessment, no matter the methodology, is critical for gathering baseline data, and measuring progress and success.

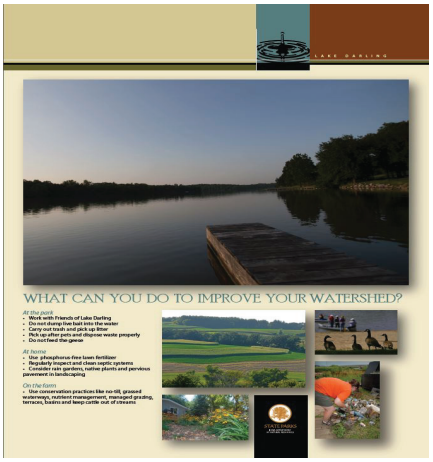
DNR rolls out new webpages for watershed authorities

Local governments looking to band together to improve water quality and reduce flooding risks can now learn more from new information on the DNR's website.

The new pages focus on Watershed Management Authorities, which are mechanisms for cities, counties, soil and water conservation districts and stakeholders to cooperatively engage in watershed planning and management.

Visit www.iowadnr.gov/Environment/WaterQuality/WatershedManagementAuthorities.aspx for information on forming a WMA, to learn about existing WMAs and more.

DNR installs watershed kiosks at parks



This summer, the DNR is installing kiosks and posters in 11 state parks to educate park visitors about water quality.

The kiosks offer information on how watersheds work, efforts in the area to improve water quality and tips for visitors to help out both while in the park and when they return home.

The state parks include:

- Big Creek, Polk County
- Emerson Bay, Dickinson County
- Geode, Henry County
- Lake Darling, Washington County
- Lake Macbride, Johnson County
- Lake of Three Fires, Taylor County
- Lake Wapello, Davis County
- Nine Eagles, Decatur County
- Prairie Rose, Shelby County
- Union Grove, Tama County
- Viking Lake, Montgomery County

On-farm nitrate reduction helps protect town wells

Results from a five-year on-farm research project are helping a northwest Iowa farmer keep valuable land in production while reducing nitrogen runoff into shallow wells that supply water for a nearby community of 7,000 people.

The project also shows how research can be used to expand farmer options outlined in the Iowa Nutrient Reduction Strategy.

The project brought together local landowners, officials from the city of Sioux Center, the Sioux County Soil and Water Conservation District, USDA-NRCS, state and federal service providers and professors from nearby Dordt College. This unique partnership looked at five alternative cropping systems and how nitrogen moves through the soil over time.

It was funded by the Leopold Center for Sustainable Agriculture and the DNR's Source Water Protection Program for Targeted Community Water Supplies.

At the forefront, offering land and labor, was Matt Schuiteman of AJS Farms, whose family has been farming the land used in this study for more than 30 years. Beginning with the Leopold Center research grant in 2009, Schuiteman worked with Dordt College environmental studies professor Robb De Haan.

They designed and implemented five experimental cropping systems on roughly 40 acres of land adjacent to and above a bank of shallow wells that provide more than 50 percent of the drinking water for Sioux Center.

"The idea was to use perennial crops and cover crops to keep the nitrogen in the upper layers of the soil and available for the next season, and apply just what the crops need when they need it," De Haan said.

Designed for standard farm equipment, the systems ranged from continuous corn with a winter rye cover crop to perennial grass for hay (common for wellheads but generally a low-income choice for the landowner).

Farmer and landowner Matt Schuiteman. Courtesy Leopold Center.

Three other systems used rotations of oat-alfalfa-corn; oat/red clover-corn; and soybean-winter wheat-corn. The perennial grass and alfalfa systems received no commercial nitrogen applications; other systems received nitrogen fertilizer as needed.

Researchers collected 6-foot-deep soil samples from each plot every fall, and divided these into 1-foot segments for analysis of nitrate N concentration. The information was used to construct nitrate N profiles for each plot, and to track nitrate N movement over time. Results illustrate opportunities for farming the land as well as managing water quality.

As expected, the continuous corn with rye left high levels of residual nitrate N in the top 2 feet of soil. The grass hay averaged five-fold fewer residuals for every year and at every depth, proving to be the most effective system for reducing nitrate N escape into local drinking water. However, wheat with soybean and corn performed better than continuous corn with rye. Adding a tap-rooted legume, such as red clover or alfalfa, to corn dramatically dropped residual nitrate N levels throughout the profile.

Schuiteman said he was surprised at the effectiveness of alfalfa in managing both the amount and distribution of nitrates in the soil profile. But he was disappointed that wheat and oats were less effective in cleaning up nitrate at the lowest depth. Based on the findings, he is planning to implement a four-year rotation of two years of alfalfa followed by two years of corn. Oats may be included for weed and erosion management during alfalfa establishment.

Dordt College agriculture professor Ron Vos will analyze profitability of the systems using Iowa State University annual custom rates and prices.

Preliminary analysis comparing two of the systems, oat-alfalfa-corn and continuous corn with a winter rye cover crop, showed the continuous corn-rye with the highest average profit per acre but also the most variable for 2009 through 2012. Full results from the project are expected later this year.

For more information and links to a video about the project, go to the Leopold Center website, http://www.leopold.iastate.edu/grants/e2009-22.

Article courtesy of Leopold Center for Sustainable Agriculture

Iowa State develops new real-time erosion data model

An Iowa State University research group is exploring ways to more accurately measure soil loss and its financial impact in the state.

In an April Iowa Learning Farms webinar, ISU agronomy professor Rick Cruse explained that with an expected increase in food demand in the next 50 years, combined with ag land lost to development and soil washed away in flood years, holding valuable soil in place is critical for Iowa agriculture.

That's why it's important to have accurate, real-time erosion data.

Cruse, who leads the Iowa Daily Erosion Project at ISU, has improved the project's current model, which estimates soil erosion for every day of the year for each Iowa township. The old model relies on outdated field data.

The project's new model uses satellite data, LiDAR mapping, and remote sensing data on a HUC-12 watershed scale. Accurate rainfall data and information on tillage, residue and soil types also factor in, providing real-time erosion data.

The old model was based on 18,000 measurement points across the state, while the new model uses 300,000 to 400,000 points.

In addition, this summer Cruse and his team will measure topsoil depth at about a dozen locations across the state and compare it with farmers' crop yield maps.

"Now we can look for a relationship between combine-mapped yields and topsoil depth," Cruse said.

If this summer's research shows that relationship, the data will be integrated to the daily erosion model, helping to put a cost on soil lost from a storm or heavy rain.

"We can ask, 'how important was that rain storm last night?' If your topsoil is only 6 inches and you remove an inch, that makes a big difference," Cruse said.

Watershed professionals, both at the state and local levels, can use the new model as a screening tool.

"We can use this model to identify watersheds where we have the greatest amount of erosion damage," Cruse said. "It can help direct attention to where we need to be looking."

A beta version of the new model should be available this summer at http://wepp.mesonet.agron.iastate.edu.

A 2011 report from the Environmental Working Group, using data from the Iowa Daily Erosion Project, estimated that 10 million Iowa acres eroded at a rate higher than 5 tons per acre per year.

Another 6 million acres eroded at more than 10 tons per acre in the 2007 research used in the report.

Cruse estimates that lost soil and decreased yields add up to a $1 billion loss since Iowa's agriculture industry began in the 1800s.

The report suggests that parts of Iowa are losing soil at 12 times the standard estimate.

DATES TO REMEMBER

July 1: 319 applications due from existing projects.

July 30-31: National Strip-Tillage Conference, Cedar Rapids. http://www.striptillfarmer.com/pages/NSTC---National-Strip-Tillage-Conference-Home-Page.php

Nov. 14-15: Women Food and Agriculture Network annual conference, Fairfield. http://wfan.org/2014-wfan-annual-conference/

Ongoing: USDA-NRCS soil health webinars Schedule at: www.conservationwebinars.net/documents/planned-conservation-webinars

Power of prairie

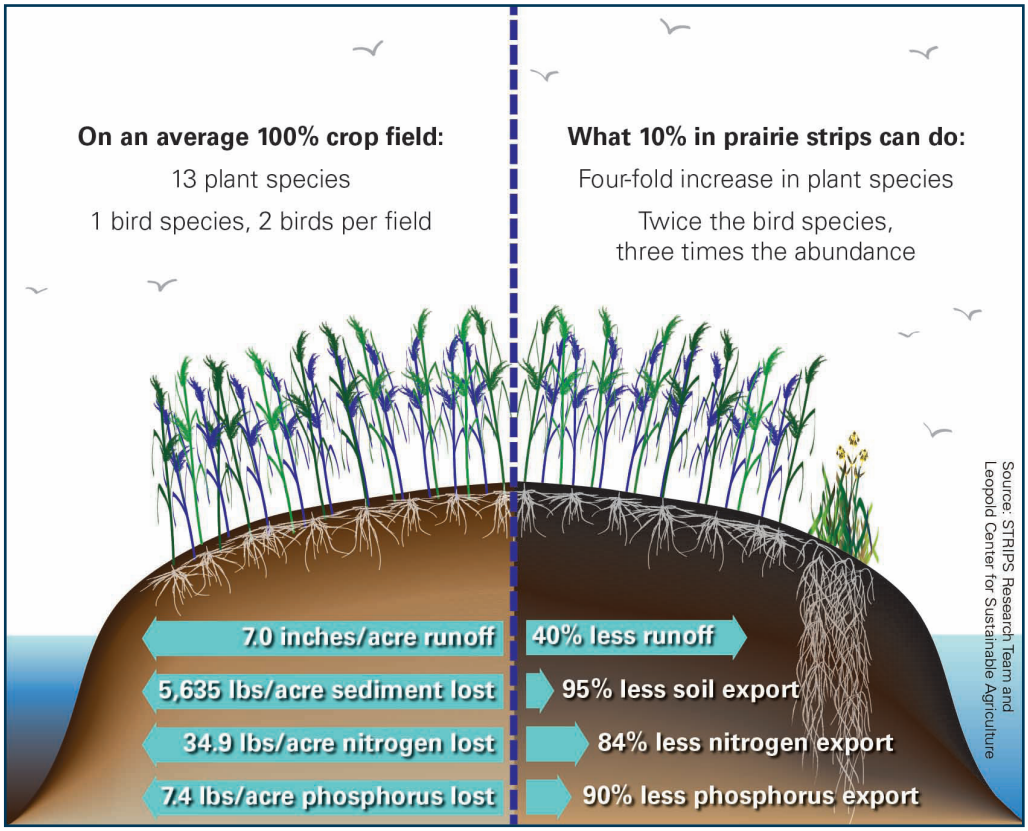
STRIPS (Science-based Trials of Rowcrops Integrated with Prairie Strips) researchers calculated the average values of various environmental and biological indicators in a corn field (left), compared to a field with 10 percent perennial prairie strips (right).

The arrows correspond to average values for surface water runoff, soil and nutrient export. Average biodiversity indicators are listed.

All measured indicators show improvement in the field enhanced with 10 percent in prairie strips. There is no appreciable loss of yield on land that remains in annual crops.

See more at: www.prairiestrips.org

Article courtesy of Leopold Center for Sustainable Agriculture



Results released for five-year study on cover crops and yield

Cereal rye cover crops added to a corn-soybean rotation seem to have little effect on yield, according to a five-year study conducted by Iowa Learning Farms and Practical Farmers of Iowa.

Ten Iowa farmers have devoted part of their acres to conduct the study. Between 2009 and 2013, the farmers established side-by-side strips of corn/soybean crops with a winter cereal rye cover crop, and strips using no cover crop, replicated at least two times.

The cover crop was either drilled after harvest or aerially seeded into standing crops each fall. At each site, the cover crop was terminated the following spring by herbicide.

When the project began, farmers were concerned that the winter cereal rye would impact corn or soybean yields negatively. But after harvest was completed each year, the farmers reported that this was not so. The properly managed cover crops had little to no negative effect and, in some cases, actually improved soybean yield.

"When I first started the trial, I thought the following crop would suffer because of the competition for water and nutrients," said Butler County farmer Rick Juchems. "That has been proven wrong with stronger yields and better soil quality." Juchems' corn yields remained steady and he saw a slight improvement in soybean yields on the cover crop acres last year as well as in 2011.

Proper management is key when incorporating cover crops into a corn-soybean rotation. Knowing which cover crop to plant, plus when and how to plant and terminate the cover crop are the main components to successful management.

There are many resources to help farmers with these management details, such as a cover crop farmer champion contacted through the ILF or PFI network, or a local Iowa State University Extension and Outreach field agronomist or USDA-NRCS field specialist.

Cover crops provide numerous benefits to farm fields. They reduce erosion by holding soil in place, increase soil microbial activity and nutrient cycling, reduce excess nitrogen and increase soil carbon.

The biomass from the plant helps to build soil organic matter as well. Cover crop varieties range from grains like cereal rye, legumes such as hairy vetch, and brassicas including radish and rapeseed. Winter cereal rye was the only cover crop used in this study.

A four-page summary of the study is available online at the ILF website: http://www.extension.iastate.edu/ilf/content/cover-crop-research, and the PFI website: http://practicalfarmers.org/farmer-knowledge/research-reports/

Article courtesy of Iowa Learning Farms

Check out Conservation Central at the Farm Progress Show

This year a team of experts goes beyond answering your conservation questions.

Prepare to be entertained, educated and relaxed at Conservation Central during the Farm Progress Show in Boone Aug. 26 to 28.

Outside, stop by the new Mobile Soil Health Lab, the spot to learn more on soil compaction and soil health benefits.

Take a look at a blown-up view of living soil (and microscopic soil organisms). Or, walk along the nine cover crop plantings.

Find the key to cover crop success, one of the latest in soil-conserving, water-quality creating tools for farmers.

Inside Conservation Central, plan to hear ag groups and FFA students duke it out in Farmer Feud, twice daily.

Or, stop by for illuminating talks on topics farmers care about, including Elaine Kub, grain marketing expert, and Lance Gunderson, Ward Laboratories, discussing the new Haney Soil Health test.

As always, plan to find answers to all your conservation problems from experts with conservation solutions.

From our team of agency and non-profit specialists, find out how to improve soil health and water quality, reduce nutrient runoff, plan a woodland, choose the right plants to increase pheasant habitat and many more solutions.

This year's partners include: Boone County Soil and Water Conservation District, Conservation Districts of Iowa, Iowa Agriculture Development Division, Iowa Association of Water Agencies, Iowa Chapter of Soil and Water Conservation Society, Iowa Department of Agriculture – Division of Soil Conservation, Iowa Department of Natural Resources, Iowa Department of Transportation – Roadside Vegetation, Iowa Land Improvement Contractors, Pheasants Forever, Practical Farmers of Iowa, Trees Forever, USDA Farm Services Agency, USDA Natural Resources Conservation Service.

Water Quality Index tool helps assess quality of runoff

A new tool from USDA-NRCS helps assess the quality of water leaving a field.

The Water Quality Index for Runoff from Agricultural Fields (WQIag) is a qualitative, multivariate tool that characterizes the quality of water exiting as surface runoff at the field scale. It is a simple, transparent and easy-to-use web-based system.

In combination with the published literature, the WQIag captures heuristic knowledge of different disciplinary experts such as soil scientists, agronomists, nutrient management specialists, and irrigation specialists and conservationists.

Based upon the field characteristics, crop management practices (nutrient, tillage, pest control, irrigation and drainage) and structural practices; it ranks runoff water from 1 to 10 with 10 being the best and 1 the worst.

Access the tool at http://wqiag.sc.egov.usda.gov

Article courtesy of USDA-NRCS

CLEAN WATER STARTS WITH US

WATERSHED IMPROVEMENT IN IOWA

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