

## Water Monitoring Explores Nutrient Loads Following Drought

After nearly four years of drought in some parts of Iowa, the spring rains finally arrived and restored soil moisture to normal levels. Although good news for farmers, Iowa soils can have an excess of residual nitrate-N that is vulnerable to leaching into rivers and streams after an extended dry period.

Streamflow and nitrogen loss varies widely in response to annual precipitation excess or deficit, similar to crop yield. When the analysis of yield (production per area) is broadened to include environmental measurements, it can help assess progress toward Iowa Nutrient Reduction Strategy goals. Even though crop and nutrient yields are impacted by weather, some key differences exist.

First, crop yields can suffer poor performance by too little or too much water. But that cycle is over once the crop is harvested and the final yields are measured. Whereas in soil and water, nitrate-N delivery to rivers is generally more problematic as conditions get wetter, and there can be a lag where prior years' conditions continue to add nitrate-N. Because this cycle is irregular and often longer, assessing how well agronomic and conservation practices address the issues is confounded.

Year to year weather variability generally has a bigger impact than any single practice, so it is important to replicate and continue studies over time to reach a conclusion. While weather varies each year, patterns are cyclical and different years can experience similar conditions. Comparing wet years to wet years and dry years to dry years provides a better picture than comparing chronological years.

Another technique to evaluate environmental data over time is to use a paired approach. By comparing two separate but similar areas, differences can be attributed to something besides the overall conditions affecting both.

Elk Run is a 21,000-acre watershed straddling Carroll and Calhoun counties. Nearby Prairie Creek watershed drains 18,000 acres of similar agricultural land and has more typical stream nitrate-N levels. Calhoun County had extended dry spells leading into the wetter years analyzed here.

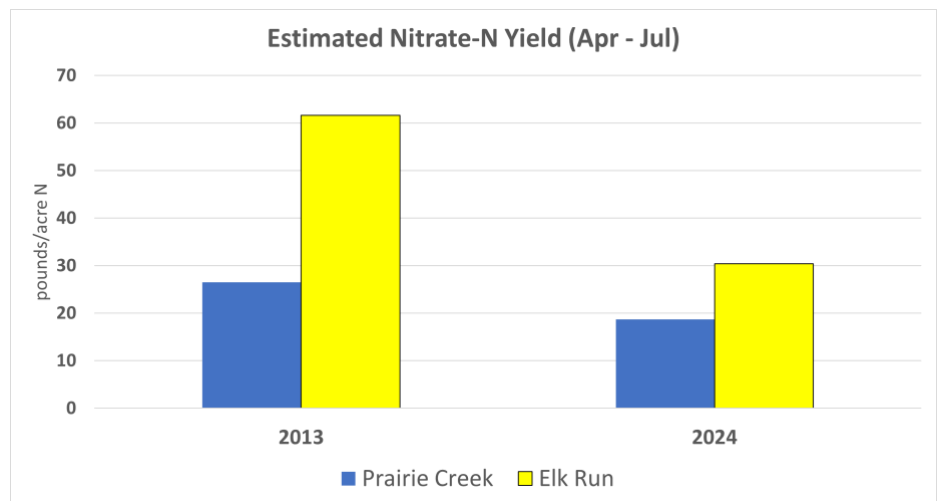


Figure 1. Nitrate-Nitrogen loss from two North Raccoon River watersheds post-drought.

Overall, precipitation patterns were similar in the two watersheds. Nitrate-N yields were lower in 2024 than in 2013. However, the difference between streams shows a greater nitrate-N reduction in Elk Run. (Figure 1.) If the discharge had been the same in June 2024 as in June 2013, Prairie Creek would have lost the same amount of nitrogen (26 lbs/acre.) As it was, Prairie Creek nitrogen loss was 29% lower in 2024.

In Elk Run, nitrate-N loss was 51% lower in 2024 than in 2013. Further evidence of improvement is shown in Elk Run when the same flow is assumed for June 2024; there would still be a 34% reduction between the two years, while Prairie Creek showed none. So, while the difference in nitrogen loss from Prairie Creek was driven by less flow in June, Elk Run showed a more significant reduction based on factors beyond the water yield difference.

The reductions in Elk Run suggest that increased efforts significantly impacted nitrogen loss from the watershed compared to other Raccoon River tributaries. As farmers implement more conservation and edge-of-field practices, the amount of nitrogen loss should continue to improve.

### **Farm to River Partnership Renewed**

The North Raccoon Farm to River Partnership, an Iowa Water Quality Initiative (WQI) that began in 2018, has been renewed for another three years. The project, managed by ACWA, began in a watershed that covered portions of Sac, Calhoun, Carroll, and Greene counties. It has now grown further into Sac County and encompasses all of Greene County.

“With the geographic expansion of the project, we are targeting batch-and-build installation in Sac County and cover crop adoption in Greene County,” says Joe Wuebker, conservation agronomist and project manager. “Conservation practices can still be adopted in all of the Farm to River Partnership area and cost share is available through this WQI.”

The batch-and-build efforts began last fall with ACWA and IDALS partnering with the Sac County Board of Supervisors to install bioreactors and saturated buffers within closely located groups in the same timeframe, saving time and money. With the Farm to River project, there is no cost for installation to the farmer or landowner.

“We’ve had a lot of interest in these practices and I’ve met with people in groups and one-on-one to discuss their benefits,” Wuebker comments. “I show them a bioreactor installed just north of Sac City, so they can see what they look like and learn how they function.”

He is working closely with the four county NRCS offices and with Iowa Cover Crop, a new business near Jefferson, to coordinate cover crop application and cost share paperwork for entire project area.

“This new relationship with the local NRCS conservation assistants has been great,” says Wuebker. “With these types of projects, we’ve strengthened our relationship, which has helped both organizations.”

Since the Farm to River renewal, Wuebker says cover crops have been planted this fall on more than 6,500 acres, and technical assistance was requested on another 4,000 acres, mostly in Greene County. Working with Iowa Cover Crop as a seed source and for application has come full circle. The company was one of the first to participate in the [Cover Crop Business Accelerator Program](#), a partnership with Iowa Soybean Association and Practical Farmers of Iowa, funded through the Walton Family Foundation.

### **Informing Ag: Conservation Manager Presents to ISA**

Recently, Iowa Soybean Association staff engaged in a Lunch & Learn session with Ruth McCabe, conservation manager at Heartland Co-op and a 2022 USA Nuffield Farming Scholar. ISA is a supporter of the [Nuffield International Farming Scholars](#) and an associate member of ACWA.

Ruth's presentation, "A Bird in the Hand: Leveraging Short-Term Profits for Long-Term (Farm) Sustainability," focused on exploring adoption of conservation farming practices in major grain-producing countries. She discussed topics including the primary drivers of conservation farming adoption around the world, how conservation stakeholder support can improve the adoption of conservation farming practices in Iowa, and how agricultural retailers can support and increase the adoption of conservation farming practices among their customers. [Click Here](#) to review Ruth's insightful presentation.

### **Upcoming events:**

#### **ACWA Board Meeting and Education Session**

**Thursday, December 12**

***Iowa Soybean Association, 1255 SW Prairie Trail Parkway, Ankeny***

**10:00 am-12:00 pm: Education Session — *Sponsored by The Nature Conservancy***  
**(CCA credit available)**

#### **[Sustainability & Ecosystem Services: A View of Current and Potential Future Demand Drivers](#)**

Understanding how to parallel sustainability practices and the vast array of ecosystem service markets can seem overwhelming. In this session, our speakers will break down the elements of current and potential future programming as you consider viability within your organization; learn about some of the different incentive programs, the available tools, the importance of tracking and data collection; and forecasting what's on the horizon to help you connect farm customers with emerging opportunities that will help drive your ROI.

**12:00-1:00 pm – Lunch**

**1:00-3:00 pm – ACWA Board Meeting**

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*Agriculture's Clean Water Alliance (ACWA) is a non-profit association whose mission is identifying and advancing solutions that reduce nutrient loss, build healthier soils, and improve Iowa's waters. ACWA is recognized for its ability to build upon its members' extensive relationship with farmers across Iowa.*

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