NLRS Annual Partnership Conference

Meeting Minutes
Thursday, January 25, 2024
9:00 am – 4:00 pm
At Illinois Department of Agriculture's John R. Block Auditorium
and online via WebEx

Meeting Minutes

Attendance

On January 25, 2024, 74 people attended in person and 156 people attended online, totaling 230 people.

***Policy Working Group Members in attendance included**: Megan Baskerville, The Nature Conservancy; Aubree Basso, American Bottoms Regional Wastewater Treatment Facility; Amelia Cheek, Illinois Farm Bureau; Albert Cox, Metropolitan Water Reclamation District of Greater Chicago; Paul Davidson, University of Illinois Agricultural and Biological Engineering; Megan Dwyer, Illinois Corn Growers Association; Albert Ettinger, Mississippi River Collaborative; Eric Gerth, U.S. Department of Agriculture - Natural Resources Conservation Service; Julie Hewitt, Nutrient Research and Education Council; Robert Hirschfeld, Prairie Rivers Network; Liz Hobart, GROWMARK; Todd LaFountain, City of Springfield City Water, Light, and Power; Richard Lyons, Illinois Association of Drainage Districts; Rick Manner, Urbana and Champaign Sanitary District; Mila Marshall, Sierra Club; Justin Ramey, Illinois Department of Natural Resources; Kris Reynolds, American Farmland Trust; Trevor Sample, Illinois Environmental Protection Agency; Dan Schaefer, Illinois Fertilizer & Chemical Association; Steve Stierwalt, Association of Illinois Soil and Water Conservation Districts.*

Opening Comments

Director Jerry Costello II of the Illinois Department of Agriculture

Director Jerry Costello II expressed his appreciation for the presence of wide representation from partners to jointly address the complex issue of nutrient loss reduction. He mentioned the long-term commitment required to fix the problem and the availability of increased funding to protect Illinois' land, air, and water. Examples of successful initiatives were also shared, such as the notable reductions from wastewater facilities, the adoption of green infrastructure in stormwater communities, and the implementation of Fall Covers for Spring Savings program by farmers. Director Costello acknowledged, however, that the scale of projects needs to increase and that there may be challenges to meeting the current goals within the given timeline. He also expressed his commitment to working with partners and stakeholders to improve Illinois' resources. Director Costello introduced Tammy Willis, Illinois USDA NRCS State Conservationist. He highlighted her extensive background from 1995, as a Soil Conservationist trainee in Arkansas, in positions in Illinois, as a District Conservationist in Arkansas, and Area Resource Conservationist in Dayton, Ohio. In 2011, she served as Assistant State Conservationist for programs in Syracuse, New York., then as the first Assistant State Conservationist for Partnerships in New York. During her career, she completed three acting State Conservationist details in South Carolina in 2017, New York in 2018, and Illinois in 2023. She was selected as Illinois' State Conservationist in July 2023.

Investigating Inflation Reduction Act Funding

Chief Cosby of the Natural Resource Conservation Service introduced by Illinois Natural Resource Conservation Service State Conservationist Tammy Willis

Illinois NRCS State Conservationist Tammy Willis introduced USDA NRCS Chief Terry Cosby. Willis praised Cosby for leading the NRCS, an agency with numerous field offices dedicated to assisting farmers with voluntary conservation efforts. Under Cosby's leadership, the NRCS is implementing initiatives from the Biden-Harris administration through the Inflation Reduction Act funding, which provides resources for implementation of climate-smart agricultural practices, for building diverse partnerships, and for enhancing the agency's reach. Cosby, who has served in various capacities within the NRCS, brings valuable experience from his upbringing on a family farm in Mississippi, education at a land grant university, and long career in NRCS, preparing him for his role as the 17th Chief of the NRCS.

USDA NRCS Chief Cosby's address included key themes of leadership transitions, capacity, partnerships, and strategies. First, he acknowledged the Illinois NLRS leadership transition from Ivan Dozier to Tammy Willis, and introduced Scott Halpin, appointed by the Biden Administration to serve as the State Executive Director of the USDA Farm Service Agency in Illinois. He also introduced Curtis Elke, the NRCS acting regional conservationist for the U.S. Central Region. He noted that the NRCS, with a history spanning over 90 years and a workforce of more than 11,000 employees, with an additional workforce of 7,000 through contract agreements, has an ongoing commitment to conservation and its critical role in nutrient reduction. The chief underlined the agency's dedication to partnerships, especially in the face of challenges outlined in a NLRS Biennial Report, and its important involvement in programs such as EQIP and CSP. The NRCS's long-standing commitment to conservation, bolstered by significant Biden-Harris Administration funding, including nearly $20 billion for conservation and $3.2 billion for climate-smart agriculture, underscores a future focused on outcome-based conservation efforts. The chief addressed operational challenges, including the need to hire over 3,000 new employees within the next year to manage a tripled budget and expand capacity across 52 organizational units nationwide. This expansion is vital for maintaining the agency's extensive office network and enhancing its ability to effectively implement programs, address program backlogs, and streamline processes for efficiency. He discussed ACT NOW, a funding process where applications will have a much shorter turnaround time compared to the traditional processes. Emphasizing the vision for conservation on every acre nationwide, the address spotlighted the pivotal role of the Inflation Reduction Act in fostering innovative conservation strategies and the importance of partnerships in achieving these goals, setting an optimistic and action-oriented direction for the NRCS's future efforts.

Discussion:

> Question (Todd Gleason): Are you fearful that this funding will be undone due to the farm bill process?
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> Answer (Chief Cosby): We are very hopeful that this money stays where it is, and the Farm Bill and IRA funds stay separate. We have shown that this money is needed. Folks are excited about this, and we plan to implement all funds through FY26 and hope for someone to continue this funding past FY26. Think about the number of producers that we can help through IRA funding.
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> Question (Dan Schaffer): With new RCPPs coming in, do you have any plans to streamline the process for becoming a Certified Crop Adviser?

Answer (Chief Cosby): We are looking at that. Who is better to do this work than Certified Crop Advisers who work closely with producers. The hangup is the criteria for Certified Crop Adviser certification. We need help with nutrient management and one of the things we are struggling with is hiring engineers and planners. We are hoping to streamline this process to have more Certified Crop Advisers

Question (Dan Schaffer): Will old Certified Crop Advisors be certified as Technical Service Providers as well? If was good enough in the past, why can't the same be done now if we demonstrate our competence and good standing?

Answer (Chief Cosby): They should be, and we are looking at doing this again, but I haven't gotten feedback on that yet. We require a college education, and we are looking at incorporating specialized experience to count towards education. Hopefully we will have a report on this ready soon.

Question (KJ Johnson, IFCA): Will the Farm Bill be passed this year?

Answer (Chief Cosby): Congress will do their job and we will have a Farm Bill.

Question (Todd Gleason): How do you calculate threshold score for immediate approval when you walk into an NRCS office?

Answer (Chief Cosby): When a producer walks in the door, they explain the goals they are trying to achieve on their farm. We look at those practices and there is a number assigned to each of those, which might be different state to state. We know from history what a practice can do. You do not have to do a lot of practice, but we look at the variety of practices and add up the related scores. If you get a score over 20, you are approved, and you can leave that day knowing you are approved.

Biennial Report Debrief: Point Source

Rick Manner, Champaign and Urbana Sanitary District

Rick began by noting that point source partners reported a significant reduction of 6.2 million pounds of phosphorus discharge made possible by requiring plants to remove 1.0 mg/L of phosphorus and to study and optimize their removal options. He explored contributing factors in this sector's success, including providing IEPA permit requirements, establishing Bio-P as the preferred solution for water treatment, limiting the focus to phosphorus, and emphasizing watershed issues. He also highlighted progress by facility and explained that roughly 67% of P removal was achieved during secondary treatment's cell growth and solids removal. Reduction estimates from 2023-2029 provide an optimistic estimate of 50% phosphorous reduction by 2030, with the 45% statewide goal soon to be met. He ended by speaking about the challenges of rain volume, soil erosion, legacy nutrients, and sediment conditions on phosphorous loads. Despite these challenges, they were still able to reach a 34% reduction by 2022. Rick mentioned that the point source sector is likely underreporting its resources and outreach data for the Nutrient Loss Reduction Strategy. He went on to talk about NARPs and watershed groups and their recent challenges including, issues with identifying and activating stakeholders, lack of guidance, COVID pandemic, lack of partners or funds in less populated regions, complexity of the issues, and lack of explanation of NARPs permit writing. Rick's final thoughts were that if sediment is a real source of phosphorus, and if it took 20 years to accumulate, it will take decades to bleed out on its own. To reduce discharges faster than that, we must remove legacy loads. He pointed out that Florida received extensive federal assistance to address phosphorus in the Everglades and that this kind of funding could help the Mississippi River Basin. He suggested that it would be helpful if the scientists and modelers could discuss updating the fractional

contributions for each sector listed in the original 2015 strategy's Science Assessment (Figure 3.2. Nutrient sources in Illinois contributing to riverine nutrient export from the state.) It would also be useful to include sediment and soil erosion sectors. Discussion:

> Question (Robert Hirschfeld, Prairie Rivers): Can the ag sector learn anything from point source?
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> Answer (Rick Manner): Yes, not every farm needs to do every practice, but every farm needs to do something.
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> Question (Maggie Cormack): Has there been any discussion on creating credits using point source permittees who reduce more than they are required to fund non-point source reduction projects?
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> Answer (Rick Manner): Trading has been talked about, but it is difficult to do effectively. Is there also a transfer of liability?

Biennial Report Debrief: Stormwater

Layne Knoche, Illinois Extension

Layne began by highlighting the fact that stormwater sector partners have reported funding of over $2 million for both 2021 and 2022, and the Metropolitan Water Reclamation District of Great Chicago has invested nearly $1.5 million for Green Infrastructure Program projects in 2021 and nearly $45 million for the 2021 stormwater program. He mentioned that much of the active public engagement in the stormwater sector was focused on educating the public about the steps they could take in their own homes to reduce nutrient losses. Public presentations and webinars encouraged homeowners to install rain gardens, use natural lawncare techniques, and de-ice their sidewalks using environmentally friendly products and practices. The stormwater sector was also responsible for many public volunteer events that focused on local waterways. The Illinois EPA's Green Infrastructure Grant Opportunities (GIGO) program and Section 319 grant program provide funding to support non-point source pollution control projects. In 2020, a total of 47 GIGO applications were submitted to Illinois EPA. Eleven grants were awarded, totaling $5 million, with a local match estimated to be around $4 million.

Layne went on to talk about the MWRD's Green Infrastructure Program, which aims to promote green infrastructure acceptance and investment in Cook County through partnerships. This program focuses on various projects such as bioswales, rain gardens, green roofs, permeable pavement, and green streetscapes, prioritizing based on water capture capacity, flood risk, and other criteria. MWRD collaborates with local communities, executing intergovernmental agreements with partnering agencies for project facilitation and assigning long-term maintenance responsibilities. Since 2017, 93 projects with a design retention capacity of 7.9 million gallons have been selected. Completed projects provided significant design retention capacity for respective investments. Additionally, MWRD supports collaborative projects like Space to Grow, an initiative that transforms Chicago schoolyards with green infrastructure elements for stormwater capture benefits. To date, 34 schoolyard projects provide 6.54 million gallons of retention capacity.

He finished by drawing attention to a few websites and resources recently developed within the stormwater sector partners. Illinois Groundwork aims to provide green stormwater infrastructure information to stormwater professionals, local leaders, and community members so that they understand GSI design and have access to current research, tools, and resources to implement projects that reduce flooding and improved water quality. Illinois has made progress in stormwater management by creating the Green Infrastructure Inventory, a collaborative project involving various organizations, which tracked the implementation of nearly 2,000 urban

stormwater practices. This inventory aims to enhance understanding of green infrastructure benefits and to contribute to tracking progress toward statewide nutrient reduction goals.

Biennial Report Debrief: Agriculture

Michael Woods, Association of Illinois Soil and Water Conservation Districts

Michael expressed his gratitude to the NLRS Steering Committee and conference planners. He highlighted some notable takeaways from the 2023 Biennial Report, which included the successful implementation of agricultural conservation projects. As per the report, 73,000 pounds of nitrogen and 30,000 pounds of phosphorus were kept out of waterways through these projects. The report also revealed that in 2021, 6% of Illinois' cropland (1.39 million acres) implemented cover crops, and 71% of cropland was managed using conservation tillage. Furthermore, the NASS NLRS survey on nutrient management results showed that 76% of 2021 corn acres were managed using the Maximum Return to Nitrogen (MRTN) rate. Corn fertilization timing was 25% of acres in fall/winter, 35% fall-spring split, and 40% in spring. Additionally, 85% of corn acres used nitrogen inhibitors for fall/winter-applied anhydrous ammonia, and 83% for spring-applied anhydrous ammonia.

He also discussed the results of the Illinois Fertilizer & Chemical Association's 2018-22 4R Survey. Results show 78% of acres are soil tested at least once every four years, and 91% of acres applied anhydrous ammonia after the recommended fall date. Moreover, 90% of acres used nitrogen inhibitors for fall-applied anhydrous ammonia.

Michael noted that the 2023 Biennial Report showed that 50% of rivers and tributaries next to cropland had 30-foot grass buffers on both banks, and there is an opportunity to expand stream buffers by 26,700 acres. He shared that $51 million had been invested in NLRS agricultural efforts in 2021-22, not counting FSA or NRCS cost-share or staffing. A record 110,660 people attended 941 agricultural events from 2021-22, which marked a 17% increase in events focused on cover crops. He further emphasized that we are at a crossroads as nutrient loads continue to increase, and there is an urgent need to continue work in research, education, outreach, and technical support. Michael concluded by stating that sustained partnerships are fundamental to creating long-term impact, and response to weather will continue to influence NLRS efforts.

Discussion:

> Question (Robert Hirschfeld, Prairie Rivers Network): Has anyone tracked nutrient loads as compared to fertilizer sales in Illinois?
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> Answer (Greg McIsaac): N and P budgets have been done in the past. Some of us scientists are working on updates. On N, the more N is getting into corn, less into rivers in the tile drained areas. P is more complicated, but P fertilizer inputs have declined while riverine P has increased.
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> Question (Randa Watts): Why is the Ag sector's participation still voluntary when the nonpoint source nutrient pollution clearly isn't going to meet its goals?
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> Answer (Michael Woods): Bottom line is that we are in the middle, not at the end of implementation. We are still waiting to see the change and it takes time and over many acres. It takes time to make the shift and scaling up of practices. I’m not saying legislation won’t need to be looked at down the road. We are seeing increased implementation, and we need more investment in Fall Covers program and for cover crops in general. We need to unite and try to get more people and producers to implement these practices.

Question (Albert Ettinger): Do we know why nutrient loads are still increasing? Can we just blame the rain?

Answer (Michael Woods): We have multiple issues to look at. The impacts of legacy nutrients are changing our perception. It has taken years to understand how we got where we are now. We have many partners looking into this. I don't think we have a clear answer. Bottom line is that climate change is impacting us.

Biennial Report Debrief: Adaptive Management

Joan Cox, Illinois Extension

Joan discussed the nitrate-nitrogen and phosphorus loads leaving the state, mentioning that while 5-year annual average nitrate-nitrogen loads increased from the baseline, 397 million pounds per year, to 461 million pounds per year from 2016-20, they decreased to 416 million pounds per year from 2017-21. The 5-year annual average total phosphorus baseline load was 34 million pounds per year. It increased to 48 million pounds per year from 2016-2020 and decreased to 46 million pounds per year from 2017-21, which is 35% above the baseline. Joan reiterated the interim and long-term nitrate-nitrogen and total phosphorus reduction goals. Illinois NLRS includes agricultural conservation practice implementation scenarios to guide the agricultural sector's implementation strategy. Scenarios NP2, NP3, NP7, and NP8 are possible combinations of practices to meet the reduction goals. Joan focused on NP8, showing the long-term 45% reduction goal alongside 2021-22 implementation levels, stating that conservation tillage and nutrient management practices have surpassed or come close to the 2025 interim goals, according to NP8. However, we have relatively low levels of bioreactors, wetlands, cover crops, and stream buffers compared to what is needed to meet the interim and long-term reduction goals. Total phosphorous reductions in the point source sector have met the interim goals. Watershed-based plans, if fully implemented, could result in annual N and P loads dropping by 20 million pounds per year of nitrogen reduction and 3.5 million pounds per year of phosphorus reduction.

More watershed-level research is needed on nutrient reductions, notably, the Illinois River Basin P sink to source dynamics and the Rock River legacy nitrate loading from groundwater. Other factors such as streamflow, nutrient management, population change, hydrology and legacy nutrients need investigation at watershed-scale. Other needed research includes legacy nutrient contribution sources and extent statewide, including streambank erosion and phosphorus loss research methodologies and quantification. NLRS continues to need improved methods/sources for tracking nutrient reduction impacts from conservation practices, as well as an understanding of how climate change impacts water yields, nutrient loads and nutrient management practices. Future needs include continued support for human and financial support through federal and state programs, wastewater treatment funding and maintenance, NARPs implementation support, and green infrastructure training and systems development. Joan urged the partners in the crowd to take note of your sphere of influence and how some of future needs might relate best to your organization. These needs are all things partners are either working on or have identified as needs for the strategy's progress. If partners want to report their progress on research, networking, programming, or financial and human resources, then working group meetings are opportunities to share those efforts. Joan encouraged partners to explore the biennial report appendices to see the full extent of what partners are reporting and doing as of 2021-22.

Discussion:

Question (Megan Baskerville, TNC): Is there any effort by the committee to renew our implementation scenarios based on the increased water yield?

Answer (Joan Cox): I'm going to direct this to Trevor as I am not sure the water yields were updated in 2020 with the new scenario development, or if they still reflecting the baseline water yields.

Answer (Trevor Sample): The scenarios were based on the baseline nutrient loads and water yields were not updated by Dr. Reid Christianson. He also developed a spreadsheet tool for use by anyone wanting to investigate other scenarios. The Policy Working Group and the Agricultural Water Quality Partnership Forum have never really adopted one scenario. We know that there could be many different scenarios based on different combinations of practices and their respective implementation levels.

Biennial Report Debrief: Ag Water Quality Science Team

Lowell Gentry, University of Illinois

Lowell introduced the Science Team and explained that this team evaluates proposals seeking to add new ag conservation practices to the Nutrient Loss Reduction Strategy. He introduced the members of the team, noting there is one opening currently. They received one proposal this year, Drainage Water Management (DWM), which essentially aims to keep water in the field longer with a control structure. The team reviewed the proposal and research and concluded that they would not include DWM into the strategy at this time citing the need for more research. Lowell explained that the evaluation discussions included some of the limitations and uncertainties of this practice and that the mechanism for DWM is not denitrification. Tile water is very cold when this system is used after crops are harvested, and during that time nitrogen concentrations do not change. The team is concerned about the fate of the retained water and whether retained water contributes to surface runoff or lateral seepage. The science team also discussed the impacts of extreme precipitation which reduces the effectiveness of this technique because of increased bypass flow. There are also limitations to suitable site selection, requiring flat fields, which may experience leakage to the ditch if installed too close to dredged ditches. The team concluded that there is a need for more research, especially comprehensive real world, on-farm studies in Illinois. They also saw the limitations of small plot research that may not accurately reflect real-world conditions, particularly concerning lateral seepage. The team recommended future studies that concentrate on creating comprehensive water and nutrient budgets, thoroughly examine and quantify lateral seepage, and determine the fate of all water and overall efficacy of DWM.

Separately, the Science team updated the guidance for practice proposals. New guidance includes an annual submission cycle and a new email address. They also updated guidance language requesting proposals include related NRCS Conservation Practice Standards, provide supporting research results as attachments or pdf links, annotate relevant data in each study, and provide numeric data for which relevant data graphs are lacking clear numeric values. New guidelines also recommend the use of peer reviewed studies, as they provide a minimum level of quality assurance.

Discussion:

Question (Todd Gleason): Do you have a timeline on when you might have usable results related to effectiveness of DWM?

Answer (Lowell Gentry): A comprehensive study is difficult to pull off. Knowing the seepage water path is important to know and we need that data. We just don't have any data like that for Illinois. We have studies on the amount of water coming out of tile drainage, but they didn't address where lateral seepage water went.

Question (Todd Gleason): Does it matter very much if you close the structure in the fall or if you try to hold the water back during the summer?

Answer (Lowell Gentry): Investigators could try it. It would be helpful to know the long-term forecast.

Question (Albert Ettinger: The Science Team's work on practices is certainly important but is there a science team working on the question of why N and P levels are going up while P from point sources is clearly falling?

Answer (Lowell Gentry): Water flows being higher now is important to understanding N loads. If water is up 23% and nitrate is only up 5%, I personally think something good is happening. I believe we are going in the right direction with nitrogen. We are encouraging more research; we just need those results.

Answer (Trevor): Andrew Margenot is looking at streambank stabilization for contribution to P. We don't have the answers right now, but scientists are looking into some of these questions.

Nutrient Research and Education Council update

Julie Hewitt, Nutrient Research and Education Council

Nutrient Research and Education Council (NREC) was created in 2012 through a state statute. It is funded by a $0.75 cents per ton assessment on fertilizer sold in Illinois. NREC is a collaboration between agriculture groups, environmental groups, and state agencies. They ensure adoption and implementation of practices that optimize nutrient use efficiency, ensure soil fertility, and address environmental concerns related to fertilizer. NREC has invested over $39M in research since 2013 into projects at University of Illinois, Illinois State University, Southern Illinois University, Western Illinois University, and Purdue. NREC also does outreach, with multiple publications focused on cover crops, MRTN, and turf applications. Also, nearly 100 scholarly articles have been published in peer reviewed publications. NREC holds an annual Investment Insights Live event as well as field days and new Outreach and Education Partner Proposal opportunities in 2024. NREC research funding supports dozens of undergraduates, master's, and PhD students each year.

Some research funded includes streambank phosphorus loss, cover crops mixes and technologies, wheat as a double crop option to show nutrient loss reduction, the role of legacy phosphorus, WASCOB research, and basic research that could lead to new practices. NREC and NLRS are separate, but NREC does work in parallel with the strategy. They evaluate removal rates for agricultural BMP's already in the strategy, provide peer-reviewed research for BMP's not yet in the strategy, and serve on the Policy Working Group and Agricultural Water Quality Partnership Forum. NREC also funds the biennial USDA NASS NLRS Survey.

Julie noted that NREC looks forward to an increase in assessment starting in 2025 with an increase to $1 per ton of fertilizer sold, resulting in an additional $1.3 M in revenue. Upcoming outreach and education partnerships include communications grants to partners including American Farmland Trust, The Nature Conservancy, University of Illinois Extension, Illinois Soybean Association, Illinois Sustainable Ag Partnership, and Illinois Farm Bureau. Julie concluded by inviting everyone to the NREC Investment Insight LIVE event on February 15, 2024.

USGS Statewide Nutrient Loads Update

Tim Hodson, United States Geological Survey

Tim began by noting that USGS operates a monitoring network which gathers data on nutrient loads from Illinois' eight largest rivers. This talk summarizes statewide nutrient loads through water year[1] 2022, which were used in the 2023 Biennial Report. Five-year annual average nutrient loads are analyzed and compared to the 1980-96 baseline period. Continuous water quality monitoring has been used to estimate loads since 2019, with ambient monitoring used prior to that. The NLRS target is 15% (short-term N), 25% (short-term P), and 45% (long-term) reductions in both N and P. Progress is assessed based on the 5-year annual averages loading. He showed a map of the monitoring network locations. He showed statewide nitrate load 1980-present alongside water flow, noting that there was a lot of variability of both nitrate load and water flow from year to year, without a trend. In drier years, we do hit the interim, 15% reduction target, but in the 5-year annual averages, we do not meet the target.

Moving to the statewide phosphorous yield data baseline to present, Tim pointed out that even in dry years, we are above our target for P loads, which have been remained above the baseline since the mid 2000's.

He moved on to look at changes in N relative to baseline by watershed. Comparing to the current 2018-2022 period against the baseline, nitrate load from the Embarras and Vermilion watersheds were reduced 15% and 25%, respectively. The Illinois River watershed drove most of the year-to-year variability in statewide nitrate loads, with the last few years showing an 8% reduction, which likely resulted from below average flow. The Rock River has historically had the largest nitrate load relative to the baseline, but that may be decreasing over recent years. Greg McIsaac has spoken about the Rock River, noting that this river is fed by a lot of ground water, and he believes that when the baseline was computed, this groundwater entering the stream was relatively uncontaminated, but over time nitrate has accumulated causing a lagged or legacy effect that skewed the baseline. In other words, when we measured the baseline, the nitrate load did not reflect current land management.

Moving onto phosphorus loads, Tim noted that the largest decrease of phosphorus has occurred on the Illinois River which is down to 22% higher than baseline. Greg has also investigated this utilizing the USGS ambient monitoring network to account for phosphorus loads searching for clues about the increase in phosphorus. The Sangamon saw an increase due to wastewater from Decatur, which is anticipated to decrease soon, and accounts for about 1/5 of the increase in P in the Illinois River. Otherwise, increases in phosphorous are unaccounted for. Increased Phosphorus is measured at the outlet of the Illinois River, but it is not found in the tributaries, so it is inferred that the phosphorus must be coming from somewhere along the mainstem. Lacking a better explanation, we believe this is another legacy effect. Historically, the mainstem has acted as a sink for sediment and, presumably, phosphorus, and now we are seeing that sink fill up and more phosphorus flowing downstream.

We have also seen increases of 101% on the Little Wabash and 118% increase on the Kaskaskia (the largest increases in the state by percentage). Some of this may be caused by increasing flow from our southern watersheds. But for whatever reason, these two watersheds seem more susceptible to that effect than the Embarras and Big Muddy watersheds.

[1] A "water year" is defined as the 12-month period beginning October 1 through September 30. The water year is designated by the calendar year in which it ends. Thus, water year 2022 ends on September 30, 2022.

In a general overview of water year 2022 relative to baseline, USGS saw a 22% decrease in nitrate from baseline, whereas phosphorous was up 19%. For the 5-year period, loads were down 3% below baseline for nitrate, and up 37% for phosphorous above baseline. Relative to 2010, there seems to be progress since recent 2022 loads were 26% below the 2010 loads and phosphorus was down 7%.

In the water year 2020, we saw a peak in water flow. Since 2020, we have seen N and P loads come down, primarily from the Illinois and Rock rivers, as the flows come back down. In contrast, we see that in southern Illinois, flow and phosphorus increased in recent years.

As key takeaways, we are turning a page. Maybe we should stop saying, "nutrient loads are still increasing," and start saying, "nutrient loads are decreasing overall, but we still have work to do." These legacies will persist, but progress will have tangible benefits for Illinois. For example, the Illinois River has had issues with harmful algal blooms, but with the reduction in P coming from point sources in Chicago, hopefully that will help prevent those algal bloom problems. There are many benefits to our rivers from the progress we've made, even though we haven't met our final targets yet.

Discussion:

> Question (Holly Hudson): Could the changes from N and P from baseline be presented as pounds per year per acres? That might provide a clearer comparison between the river basins. Would that be possible?
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> Answer (Tim Hodson): It is possible, and he has this information. He asked that person to follow up with him.
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> Question (Steve Warmowski): Referring to the change in nitrate graph, what is Vermillion River doing right, and what does the Rock River need to do?
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> Answer (Tim Hodson): Great question, I do not know the answer. It is not that the Rock is doing anything wrong, but we do believe there is a legacy issue there. That river is receiving flow from an aquifer that has been contaminated with nitrate. It will be a lag effect and hopefully in coming years if practices are improving in this watershed, we will see improvements to that aquifer and see changes in the Rock as well. I do not know the explanation for the Vermilion nor why there have been increases in the south (Kaskaskia/ Little Wabash).
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> Answer (Greg McIsaac): The Vermilion and other tile drained watersheds seem to reflect improved N management for corn. The same may show up in the Rock eventually, but the Rock River basin also has more irrigation.
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> Question (Rick Manner): I want to believe we are making the progress you have stated since 2020, is it more than just the decrease in rain? Have you looked at the data and normalized it to make sure that is accurate based on rainfall.
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> Answer (Tim Hodson): I have not looked at 2020 too much. I try to focus on longer term trends. Flow normalizing can be tricky. The NLRS uses 5-year annual averages which has a similar effect, although not quite the same as normalization. The main thing I would note is that nitrate is down 22% relative to baseline, whereas flow is 7% above baseline, which indicates progress in the right direction. He asked Rick to reach out for more information.

Question (Ben Schmidt): In western New York, he worked on cleaning up phosphorus in Ontario nearshore waters. We knew where P was coming from because a local professor did research on the Genessee river, and they figured it out. Where is that data in Illinois? I think we can solve this problem.

Answer (Tim Hodson): Yes. This talk focused on the 8 major watersheds. The ambient network is a fantastic database, Greg and I have worked with it a lot. Greg has a paper that refers to the subwatersheds that track down sources and we have computed these loads for the rest of the state. Hopefully we will be preparing some of these reports and some of the points from this presentation. We do have some of that data and it is public. We have a USGS data release that Greg and I use in our analyses. We could put some maps together to get better visuals in the short term.

Question (Christine Favilla): When do you see CAFOs being regulated for excess nutrients?

Answer (Tim Hodson): I don't know. USGS is a monitoring agency, not a policy agency. We try to get the data to inform policy and I cannot speak on what policy will be.

Question (Greg McIsaac): Is the research from New York publicly available?

Answer (Ben Schmidt NRCS): Search for it from University of New York at Rockport.

Iowa NLRS Dashboard Overview

Matt Lechtenberg, Iowa Department of Agriculture and Land Stewardship

Matt is the Iowa Water Quality Initiative Coordinator and leads non-point source. He has been in this role since the program was established by the Iowa State Legislature in 2013 after the release of the Iowa Nutrient Reduction Strategy. He works in partnership with Iowa State University on the science side and with Iowa DNR, which leads the point source side.

The strategy includes information about how to track, report, and identify the resources needed. The strategy is rooted in indicators used to develop the Iowa Nutrient Reduction Strategy. It estimates land use changes and nutrient management practice adoption over time. This dashboard was a broader effort to create tracking and recording methodology. Aside from the three principal agencies, a subcommittee of representatives from Iowa Water Resources Coordinating Council and the Watershed Planning and Advisory Council developed a logic model and tracking and reporting indicators to inform progress. Watershed Planning Advisory Council representatives participated on the subcommittee as a voice for the non-governmental organizations in the state.

After the strategy's development, Iowa published a traditional annual report. The effort was valuable. However, by the time it was ready to publish, some of the indicator data had changed significantly. Iowa looked at doing a dashboard early in the process before they fully established all their data sources. The Iowa Legislature established an NRS measures coordinator at Iowa State University in 2015. Today that person is Rob Davis, who has been a lead developer on the NRS Dashboard.

The dashboard is an effort to improve the reporting process, make it more interactive, and update it more regularly. Iowa developed the dashboard with support from EPA through Hypoxia Task Force funding in 2020 and transitioned to an interactive land and point source data dashboard in 2021. A full dashboard was released in December 2022. The data collection and compilation processes are similar to those for the traditional report, but updates are made available more regularly. The dashboard is less narrative and more visual than the annual

reports. Using the dashboard resulted in having a better handle on the trends and implementation improvement efforts. Matt provided a tour of the Iowa Nutrient Reduction Strategy website, demonstrating sorting functionality on the water quality, land use/ in-field practices , funding and resources, and human dimensions dashboards.

Discussion:

Question (Ellen Dilinscky, NGRREC): How often is the dashboard updated?

Answer (Matt): Each water monitoring year it is updated. Other data take longer since tracking down the implementation efforts can be challenging. We are getting a better idea of data availability timing. A release does not need to happen every time the dashboard is updated.

Question (Greg McIsaac): Does Iowa survey farmers on N and P use?

Answer (Matt): Yes, there are a variety of sources in the data. Each sources uses different methodology. So, it has been a challenge. However, this is one of the things we have been working on. A census comes out every 4-5 years.

Great Lakes to Gulf Dashboard Overview

Laura Kammin, National Great Rivers Research and Education Center

Laura talked about the Great Lakes to Gulf Virtual Observatory, a website that allows geospatial visualization of big data sets. This is similar to the Iowa NRS Dashboard with a slightly different look. Laura showcased major features of the website starting with the USGS ambient monitoring network data. Great Lakes to Gulf currently features 13 data sources including Illinois EPA's ambient monitoring network, USGS super gauges, Water Quality Portal, NOAA, Upper Mississippi River Restoration Long Term Resource Monitoring Program, Great Rivers Ecological Observatory Network, Fox River Study Group, Iowa Water Quality Information System, and so on. She highlighted the Fox River Study Group data and demonstrated how to view and select parameters. The website is interactive and allows the user to explore. Laura mentioned they continually look for feedback and additional datasets and invited members to contact her with suggestions. The site features 17 different layers, including SPARROW 2002 and 2012 Models, hypoxia extent 2005-2021, state legislative districts, congressional districts, watershed boundaries, river reaches, large rivers, USDA CropScape frequency, NOAA precipitation, state impaired waters, total annual nitrogen from point sources by HUC8 (averaged from 2008 to 2014), average annual nitrogen fertilizer inputs 1997-2006, and others not listed in this presentation.

They are working with Dr. Kaiyu Guan at the University of Illinois on long-term, high resolution remotely sensed data for cover crops, tillage practices, and planting and harvesting information. Dr. Guan is specifically looking at the impact of corn fraction and tile drainage on nitrogen concentrations on the landscape. He has developed algorithms to track cover crop adoption at the field scale in real time which allows for visualization of "what if" scenarios. This may have policy implications for annual practices, such as cover crops, which require annual funding compared with structural practices that last longer. They recently added a green infrastructure layer, developed by Lisa Merrifield. They are hoping those data can be expanded on but are unsure who would carry that project onward. National Great River Research and Education Center (NGRREC) staff recently met with the Fox River Study Group and learned valuable feedback that not all practices listed work well for each agency. They want to make this tool as useful and productive as possible.

Conservation Agriculture practices comprise another dashboard on the website. Dr. Reid Christianson collected data from NRCS and prepared it as an inventory for this dashboard, which includes data from EQIP, CSP, and IEPA 319 programs within the Mississippi River Basin. Historically, coupling nutrient movement lag times with annual variations in rainfall and changes in rainfall patterns makes a simple assessment of water quality incomplete. Adding an estimate of mitigation efforts, or conservation practices, allows us to extrapolate the costs to meet water quality goals and provides us with weather-independent assessment of efforts. Through this tool, you can select particular watersheds and view which programs and funding are available to a specific watershed. In addition, they are working on thematic maps to allow users to see at a glance where practices are being implemented or where funding sources are being utilized, which helps policy and decision makers. Six states are currently included on State Data Portals, including Illinois. Hopefully all twelve states are included by the end of the year. Currently, the Illinois Data Portal includes statewide and watershed-level total yields of P and N.

Another dashboard in development on the Great Lakes to Gulf website is the Nutrient Trends Dashboard. Different groups working within the Mississippi River Basin have different ways of presenting water quality information and calculating nutrient trends. By selecting a network of existing long-term water quality monitoring stations as trend sites and using a unified analysis method, progress on nutrient reduction within the Mississippi River Basin can be evaluated. It could also simplify the process of exploring nutrient trends in watersheds crossing state boundaries. Dr. Alejandra Botero Acosta of NGRREC is working on harmonizing these data. They selected a network of existing long-term water quality monitoring stations as trends sites with data found in the Water Quality Portal and are working on harmonizing data to create a consistent and quality-controlled dataset. This data set would be unified in parameter names, units, types of measurement, etc. This dataset will be presented on a dashboard coupled with flow data from USGS National Water Information System (NWIS). It uses a unified analysis method (WRTDS) to explore nutrient trends across states and watersheds. They started out using the longest consistent record available from 1990-2020 but found that range to be too long. They recently decided to focus in on 2000-2020 data because more sites were available. This Nutrient Trends Dashboard is coming soon and will allow the user to visualize the station site trends across the Mississippi River Basin. Laura noted that there is a lot of river monitoring in the Upper Mississippi and Illinois and the southern states are not able to monitor as much currently. Laura displayed data for the Sangamon River as an example to show flux and concentration graphs. They plan to reach out to state members for feedback in the next few weeks.

Great Lakes to Gulf developed storyboards in the past but found that communication channel to be static and quickly outdated. In response, they have moved to using blogs with the most up to date at the top. These are date stamped to help users navigate the chronology of information. Laura ended by acknowledging the Walton Family Foundation for their funding. She noted that the Great Lakes to Gulf Project is a partnership between the National Great Rivers Research and Education Center and the University of Illinois National Center for Supercomputing Applications.

Discussion:

> Online question (Kara Downin, Knox Co. SWCD): For the Great Lakes to Gulf Ag Dashboard, have you considered also including state cost-share projects, such as PFC or SSRP, and not solely NRCS and EPA 319 projects? For example, in our county alone we completed 15 state cost-share projects in 2023.
>
> Answer (Laura Kammin): We do want to have more data and are interested discussing more with Kara.

Answer (Ellen Gilinsky, NGRREC): We plan to add more data. Reid's data was baseline and working toward getting more data. Adding fertilizer and cost-share data is a great idea. They are reaching out to states for this information and will need to build data out as layers.

Online question (Holly Hudson): On the slide with "EQIP-funded programs by HUC8" does that represent number of programs vs projects?

Answer (Laura Kammin): The number represents the number of programs for the map slide. You can find this information on the dashboard under the results section.

Question (Todd Gleason) Are the green infrastructure pages based on the number of sites, the number of practices, or something else? Is there a common geographic marker? Something like number/acre? Or is it simply based on the political boundary of the village/city?

Answer (Laura Kammin): That is based on the number of practices. Our tech guys would know.

Answer (Max Burnette and Jong Lee): There are two different views to the green infrastructure data. They are displayed by HUC 12 geographic area and the number of practices on the right, and then they are aggregated on the left side. The source data is the same.

Illinois NLRS Dashboard Discussion

Trevor Sample, Illinois Environmental Protection Agency

Trevor presented the option of adopting an online dashboard for communicating the strategy with stakeholders and the public, to take the place of the large, biennially produced print version currently in for reporting Illinois strategy updates. The proposed dashboard, leveraging the Great Lakes to Gulf virtual observatory platform, could be a more dynamic and interactive approach, allowing data on water quality as well as data on agricultural, point sources and urban stormwater resources, outreach, land and facility implementation to be presented spatially and interactively. The Steering Committee, along with Policy Working Group could guide the development of this dashboard, ensuring data is not only comprehensive but also publicly accessible for partner organizations to analyze. As we move towards a more digitally integrated reporting system, partner updates could evolve into more media such as storyboards or slideshows. The Steering committee will issue a survey to Policy Working Group members to gage interest in adopting online dashboards. Should the PWG decide to adopt online dashboards, the goal is to have the dashboards operational by the end of 2025, marking a significant step forward in data reporting and accessibility in Illinois.

Discussion Summary:

Key themes emerged around the use of existing water quality and land and facilities data collection as well as the resource and outreach spreadsheets. Discussion topics included the frequency and methodology of dashboard data updates, with options ranging from quarterly to biennial and considering the addition of a concise executive summary to complement the dashboard. The conversation also delved into audience engagement and the effectiveness of data presentation, drawing parallels to use analytics and audience characterization possibly available from the Iowa Dashboard team. Furthermore, there was a focus on the potential of linking research directly to the dashboard for enhanced accessibility. Action Item: Many members emphasized the need for further reflection and gathering of feedback through a partner survey.

Discussion Detail:

Question (George Czapar): Do we have the resources built in?

Answer (Trevor Sample, IEPA): We have the necessary resources. We have the data in spreadsheets. The current plan does not involve significant changes to these resources. Instead of compiling them into a traditional report, we're looking to present these data in new ways through the dashboard.

Question (Trevor): Regarding the frequency of updates, should it be annual or biennial? How will we tell the story from all the different sectors?

Answer (Trevor): The update frequency for the dashboard is still under consideration, with options being either annual or biannual. This will depend on PWG preferences. The idea is to simultaneously narrate the story from all different sectors involved. Once the dashboard is updated, everyone will have access to view it. Additionally, the creation of a short executive summary is being considered to provide a concise overview of the updates.

Questions: Don Guinnip, ICGA) – Does anyone have an idea of the audience analytics on the Iowa dashboard? What kind of acceptance/use has it seen? Who is the main audience for the dashboard?

Answer: (Laura, Ellen, NGRREC): Great Lakes to Gulf uses Google analytics to track number of hits. Jong Lee from NCSA operates the back end.

Answer (Todd, Extension): Blue Waters on campus, tools should be available to be updated quickly and simply, similar to FarmDoc website.

Online Comment (Todd): From the communications side, if you'd like the dashboard to be more effective it should be updated often and then information automatically sent to registered users. There is a reason FarmDoc Daily works, or for that matter newspapers or nightly news or daily radio programs. Those are updated regularly. I would think a monthly release using the data could do a lot of good in making people recognize the work being done, realize why it is important, and then act upon it. I'm not suggesting when the data should be updated, but that the dashboard could be used to create a constant regular stream of information.

Online Question: Will we still update the Science Team's work of adding ag practices annually?

Answer: (Joan, Extension, post-conference): Yes. As new practices are added by the Science Team's work, new practices are tracked and would be added to the metrics. Science Teamwork and decisions could be highlighted similar to how it is currently in NLRS reports.

Comment/Question (Trevor, IEPA): This idea has backing from IDOA and IEPA directors, but at this point Steering Committee wants PWG consultation. Also, similar to reviews for a report, we would run graphs and information through PWG and PBC groups prior to publishing on the dashboard. So, where do you {PWG members] want us to go with how we report the strategy?

Albert Cox: Are we suggesting a dashboard plus the summary, instead of the thick book Biennial Report?

Trevor: Yes, we'd move away from the thick biennial report and to a dashboard with a short 8–10-page summary.

Holly Hudson: This would be like dashboard with updating graphs and with an executive summary?

Answer (Trevor): Yes, we have no capacity to do all of it with the thick book report.

Comment/Question (Trevor): We can send a survey to get people's feedback. We aren't a governing body, not making rules or laws, just want feedback. Do you want a survey?

Response (general): *Several nods yes.*

Online Comment (Sanjay Sofat, IFB): I suggest the survey approach.

Online Comment (Holly Hudson, CMAP): I agree with sending a survey.

Question (Trevor): Do we want annual or biennial updates to dashboard? We have been measuring in two-year bites.

Question (Todd): So, this could be a targeted timing for an update. But is NCSA charging in a way that when data comes available, like new science team information, then they can just put it in?

Answer (Trevor) – I think piecemealing it would be hard; data rolls in in pieces throughout the year.

Answer (Ellen Gilinsky, NGRECC): - Matt L. notifies site users when there is an update, it is not the minute it becomes available, but setting a time, like quarterly, annually, biennially as a way to notify people.

Comment (Joan, Extension): We'd like to get a little more feedback from everyone and to converse more on the dashboard. How many of you saw the Iowa Dashboard before today (*several raised hands*)? What aspects of the dashboard interested you?

Comment (Liz Hobart, Growmark for Illinois and Iowa): In my role the dashboard is a great visualization. It helps to have a visual perspective to tell the story. It provides a Crop Specialist with an educational tool to use with our growers and it tells the story real time. So, it is beneficial from an educational perspective.

Online Comment (Kara Downin, Knox Co. SWCD): Please do survey asking about the dashboard. Compile every two years since partners are used to biennial updates and know to look for it.

Online (Caitlin Allen, IDOA Conservation Planner, Union Co.): I like dashboard and every two years update would be good.

Online (Debra Williams, affiliation unknown): Please do survey so folks have time to consider implications of dashboard.

Online Comment (Debra William): It seems that this year's report has brought much attention to the issues and the state of the science in the media.

Comment (Erin Bauer, ISWS) – It may be nice to have [water quality] data in less than one-year increments, such as monthly values, and yields for small watersheds. This would be more informative than looking at annual yields.

Comment (Joan, Extension): Data collection would not be different. Currently we use annual watershed loads. Resources and outreach partner inputs are annual. Land and facilities data roll in November through June (NRCS, NASS, IEPA, etc.).

Clarification (Erin, ISWS) – No, to clarify, I mean June [nitrogen and phosphorus water quality] yield data.

Question (Joan, Extension): How often are nitrate yields on dashboard at NGRREC updated, and what is the data source?

Answer (Laura, NGRREC): That is an NCSA question for Jong and Max.

Answer (Trevor): We don't compile data on a basis. Ambient stations take data every 6 weeks. And data points would just be a load for one single value. These are usually done on an annual basis, unless looking at individual data points. For continuous monitoring data, you can go to USGS and download data that's taken every 15 minutes if you want. When we compile for NLRS – we compile on annual load to show flows /load for the whole year.

Online Comment (Shani Golovay, NREC): Then it is a website not a dashboard. That is fine but call it a website, a dashboard implies it is constantly being updated.

Online Answer (Greg McIsaac, U of I retired): On monthly nutrient yields, it is possible at the IEPA ambient sites using WRTDS, but IEPA concentration data takes 6 to 24 months from sample collection to availability. USGS is looking into seasonal analysis of nutrient budgets and possibly nutrient loads. Monthly and seasonal yields can be highly variable and difficult to interpret.

Comment (Julie, NREC): My thoughts on the dashboard and the data is that NREC-funded research is online and to have it the ability to link directly to the final report from the researcher's pages. A dashboard would be more flexible and would increase access to data. The links are hyper and the printed book website links get outdated. NREC doesn't have policy arms like some of our partners, but perhaps many organizations that have a policy, the [physical large book] report update is still valuable? I think the executive summary is important for government reporting. It is nice to have something [summarized] to show as an update.

Illinois NLRS 2025 Report Discussion

Joan Cox, Illinois Extension

Discussion Summary:

The discussion underscored a consensus for transitioning to a dashboard with a printed executive summary that consolidates state and federal data into a more accessible, bite-sized format, alongside a strong interest in linking NGO partner programming and research directly to the dashboard. There was discussion on the cycle of data availability and the optimal frequency for dashboard updates and partner notifications of the updates. There was discussion on the need to establish new interim environmental and implementation goals beyond 2025 due to the anticipated shortfall in meeting the 2025 targets. A participant suggested that working groups discuss and delineate sector-specific strategies and tactics for reaching interim and long-term goals, ensuring a unified approach to environmental management. The conversation further highlighted the necessity to refresh strategies to encompass the latest research on non-point source pollution, with a special focus on streambank erosion and legacy phosphorus, emphasizing the critical role of pilot studies in identifying nutrient sources. There was a call for a broader understanding of nutrient issues, extending the focus beyond the Gulf to address rising nitrogen and phosphorus levels. The dialogue also recognized the intricate challenges of statewide environmental data management, strategy formulation, and execution, particularly under the constraints of climate change and limited research funding, highlighting the complexity and multi-faceted nature of strategy work in Illinois. Action Item: To facilitate decision-making on report formats, strategic revisions, and goal setting, the participants requested a partner survey to allow additional time for broader reflection and feedback.

Discussion Detail:

Joan asked if anyone wanted to share perspective on the larger, book-like Biennial Report with regards to transitioning away from it. She gave the example that some NGOs had indicated using the report to guide research, staffing, programming and general justification of organizational investments in consultation with their boards and partners/stakeholders. Joan asked if they would miss not having the same book summary based on their needs and how they use the report.

Comment (Don Guinnip, ICCG/NREC Board): I've had a chance to hand the new N chapter in agronomy handbook as a handout and it is useful with growers. A small, printed executive summary is valuable.

Comment (Joan, Extension): Please give a show of hands for a printed executive summary.

Response (general): Wide support was indicated by wide show of hands.

Online Comment (Albert Cox, MWRD): I think the Executive Summary should provide the level of detail that are useful for boards, etc.

Question (Todd, Extension): What should data availability policy be? Who has access?

Answer (Joan, Extension): The data published in the NLRS report is state and federal data that is publicly available. We consolidate many reports and make it bite-sized. All the data is public and accessible, we would just be pulling it together in this different format. Partners that are NGOs do research too and we showcase that, as Julie said, it would be good to link to those websites from the dashboard.

Online Comment (Jim Dunker, USGS): I'm in favor of executive summary every two years.

Online Comment (Janette Marsh, IEPA): I suggest an executive summary every two years.

Online Comment (Bin Peng, University of Illinois Science Team): There should be good planning for what type of data will be in the dashboard and how frequently they will be updated.

Answer (Joan): The data availability is over about a 6-month period. For example, NRCS, then NASS, then water loads, then private organizations, then point source loads, finally urban stormwater sector, and more. It is very spread out over a year, and now we collect it all [land and facilities data] every two years. We collect resources and outreach data yearly.

Comment (Mark Schleusner, NASS): So, you are compiling this big report from a series of other reports that come at different times. People use different pieces of data. The dashboard would need to be updated constantly and you would need to notify people when updates occur. Then we would also update the strategy every two years? Is that correct? We had this problem before when publishing a resource from many smaller reports with various people interested in various pieces of the data. It is hard to know your audience well enough to know who wants what. The more often you update the website is going to be the only way to make it most user friendly. And don't do full big book.

Comment (Trevor): Yes, no full report. But if you constantly update the dashboard with pieces of data [and notify people] you don't' get a full picture. We could do an update to the strategy every two years to consolidate the data. I caution against piecemeal fatigue if every couple of months a new piece of data becomes available online, but we don't have other data to go along with it and tell the whole story.

Online comment (Shani Golovay, NREC): My confusion is the word "dashboard." So, it looks like Iowa's is being updated more than once a year. If it is just the Biennial report online that feels more like a website and not a "dashboard". What are the distinctions between a dashboard and just a website?

Response (Holly Hudson, CMAP): Good point.

Comment (Joan): The NLRS report updates in some states are not annual or biennial reports. They just update their strategies every 5 years or so. There is a lot of flexibility.

New Topic Question (Joan): Do we want new interim goals beyond 2025? Do we want new priority watersheds?

Comment/Question (Trevor): Yes, some states do a fresh strategy every 5 years or so. We are almost at 10 years since the current strategy was released. Do we want a new strategy? New interim goals, practices, or priority watersheds? We are updating the strategy currently with each biennial report in Illinois. For example, we add new ag practices and add new recommendations on what needs to be done based on updated water quality data and research. All this text can still be put in a dashboard. So, do we want to do another strategy report, such as the thick report update? Or just move to the dashboard and our next annual or Biennial reports will move to the dashboard? We will survey folks on this.

Question (Joan): First, what are thoughts around new interim goals beyond 2025?

Comment (Trevor): To be clear, there is confusion around final goals. We have an interim goal for 2025 and a long term for 45% reduction. In our strategy, nowhere do we state a year for the 45% reduction goal. The Hypoxia Action Plan and other reports I've seen citing it state the 45% reduction for 2035. However, Illinois did not ever add this to our strategy. We could adopt this into our strategy if it is desired to place a year on the 45% goal. This would need PWG feedback.

Repeat Question (Joan): Thoughts about updating interim goals? Long term goals?

Online (Albert Cox, MWRD): Regarding resetting interim goals, it seems like a good idea. By most indication, we will not achieve the 2025 goal. So, it makes sense to establish a new timeline. However, I'm not sure of the process required to be able to state a new timeline with some level of confidence. Therefore, it may be best to set a new interim goal by 2035.

Comment (Joan): And as a reminder, point sources have achieved interim goals, and agriculture's nutrient management practices were beyond or near interim goals already [as of 2022]. However, the other ag practices such as wetlands, cover crops, bioreactors and stream buffers were well below desired implementation levels when looking at Scenario NP8.

Online Comment (Greg McIsaac, U of I retired): Examine why the goals were not met and formulate a new interim goal based on what's been learned so far.

Online Comment (Cindy Skrukrud, Fox River Study Group): I think we should be consistent with the Gulf Hypoxia target date.

Comment (Chris Reynolds, AFT): It is important to discuss updating interim goal considering strategy and how to get to the goal for the non-point sector. It is not just about setting a timeline. We need deeper discussions for how we will get there.

Comment (Michael Woods, AISWCD): We previously discussed creating critical conversations and, working with Extension shortly, we will be moving this forward on this. I am also concerned we don't pit the point and nonpoint sectors against each other. Should we let working groups discuss and digest what is appropriate for the working group to achieve and the tactics to use? And then ask the working groups to report back to the PWG? I propose the working groups identify what is best for each individual sector and see what we can achieve within the individual working groups.

Comment (Raelynn, IFB): As we talk about interim and long-term goals, we need to consider Streambank erosion and legacy P. Currently, we are conflating all non-point source phosphorus losses with agricultural losses, which is a fallacy. We need to consider how we continue to update nonpoint source [loads] in our state strategy. We need to add in the research component as is relates to non-point source P loss.

Online comment (Albert Ettinger, MRC): Is there a way to estimate how much legacy P there is out there?

Online response (Jim Duncker, USGS): Albert...we're working on it...

Comment (Trevor): Yes, the old pie chart published in 2015 original strategy stated the percentages of N and P and N-N by sector. We could update these and once we have updated research on legacy P and streambank this could also be added in as a piece of these pie graphs as well.

Comment (Joan): Yes, when we first heard about this at a PWG meeting in 2022, many of you remarked how the streambank P research could shed light as a relevant source that could require new management needs that could really impact our strategy.

Comment (Heather Krempa, USGS): There has been lots of talk on streambank erosion and where P is coming from. We have pilot studies in smaller watershed tracking nutrients using isotopes. We are tracking P coming from streambank, streambed, and various upland sources. Working in small watersheds right now, we are starting to look at this. This would quantify how much is from bank erosion, resuspension from the stream bed, versus forest, agricultural, road runoff by looking at chemical composition of soil coming from each source.

Comment (Joan): Yes, this is referring to the Integrated Water Science intense monitoring in some watersheds [post-conference clarification: This includes Indian Creek watershed in central Illinois].

Online Comment (Greg McIsaac, U of I retired): In addition to stream channels, there is little focus as to how much P is accumulating in Lakes and reservoirs in the state.

Online comment (Holly Hudson, CMAP): I suspect lake and reservoirs likely doing a large service in trapping much of their inflowing sediment and acting as nutrient sinks on average. I recall past studies by ISWS.

Online Comment (Gregory McIsaac, U of I retired): I agree. I think these studies need to be updated and incorporated into the NLRS work.

Online Comment (Steve Warmowski, AIM Illinois) Then every couple of decades the streams need to be dredged for a couple million dollars. Need to also plan in watershed management and 319 grants to stabilize stream banks and stem the flow of incoming sediment.

Online Comment (Albert Ettinger, MRC): We need to look at nutrient issues in Illinois, rather than focus entirely on the Gulf. Also, with the best science that can be mustered, let's explain why N and P loadings are increasing.

Online Comment (Kathy Paap): Annual updates are good. Many projects are based on smaller areas, not the entire state.

Online (Robert Hirschfield, PRN) There is little analysis on why we are so far from goals. Cover Crops and wetlands on a small fraction of land, we need serious examination of what we are getting for the money we are spending.

Question (Joan): Any questions about any of the comments.

Response (general): none

Comment and Summary (Trevor): This shows how complicated it all is. We are looking at all of this on a statewide basis. We know there are lots of sources, activities happening, lots of moving parts from water quality to point source, urban stormwater and agriculture. This includes all the practices and dynamics that affect it all. Then you throw in climate change and that affects it all too. This takes a lot of research, which takes lots of funding. We are doing the best we can with limited resources to look at the big picture and all these aspects all at once.

Question (Joan): Any more questions?

Response (general): none

Illinois NLRS Working Group Structure Discussion

Joan Cox, Illinois Extension

Joan presented an Illinois Strategy and working group overview reflecting on the structure and evolution of the working groups since their inception, highlighting the collaborative efforts initiated from 2008 to the 2013 launch of the Illinois Nutrient Science Assessment and the formation of the Policy Working group to the 2015 release of the first strategy and formation of foundational subgroups. The foundational subgroups formed at the publication of the strategy in 2015 were the Nutrient Monitoring Council, Nutrient Science Advisory Council (completed its work in 2018), Agriculture Water Quality Partnership Forum, and Urban Stormwater Working Group. The Performance Benchmark Committee and Communications Subgroup were added later to address evolving challenges. She also mentioned the later addition of subgroups formed to tackle distinct tasks related to technical data, tracking, and educational efforts. She noted the multi-stakeholder nature of all the subgroups, which have open membership to allow for diverse participation and maintain flexibility. The discussion that followed raised critical questions about the future direction of these working groups and whether to maintain the current structure with restricted membership balance on the Policy Working Group, or to open membership more broadly. This and more questions aimed to explore the best approach to enhance collaborative efforts and stakeholder engagement in NLRS. This was followed by a brief explanation that many of the Steering Committee members had taken over subgroup chair roles due to retirements of members and to the onset of the pandemic and shift to virtual meetings. The steering committee invites members interested in serving as chairs on the Communication Subgroup and the Performance Benchmark Committee to reach out to the Steering Committee at NLRS@illinois.edu. The conclusion of the discussion ended in an action item to add related questions to a partner survey.

Discussion Summary:

In the discussion about the membership composition of the Policy Working Group (PWG), some members supported open membership to all organizations actively pursuing shared objectives. Other members recommended that the existing members should play a role in making informed decisions on new entrants, favoring a selection process over open membership. Another member advocated for an evaluation of active engagement within subgroups before considering PWG membership and expressed caution in expanding PWG membership since anyone can be involved and offer an opinion to the PWG. Non-PWG member participants echoed all these various perspectives.

Both PWG members and other NLRS partner participants suggested that to preserve the diversity of representation within the PWG, a rotational system be instated allowing sector representation to maintain its designed balance but allowing for the ebb and flow of various partner organizations' involvement levels over time, to allow other Chicagoland urban county representation and other smaller downstate municipalities as stormwater or point source representatives. The distinction between point and non-point source policy work was noted, affirming the crucial role of subgroups and their open membership policy. It was suggested to steer clear of introducing a voting mechanism to the PWG since it does not make laws or rule and, while it values consensus and feedback, it has not utilized formal voting mechanisms before. It was suggested that such a mechanism might disrupt the balance of sector representation, and the suggestion was to either maintain the current closed membership or to shift to a completely open membership structure.

As a point of clarification, Trevor confirmed that scientists provide advisory input to the PWG group and subgroups as needed. As an action item, it was agreed that additional questions regarding membership, meeting formats, frequency, and efficacy should be included in a broader partner survey for detailed consideration. Furthermore, openings for chair positions within the Communications subgroup and as Performance Benchmark Committee were announced, with a call for interested members to express their interest via NLRS@illinois.edu.

Discussion Detail:

> Question (Joan): Do we maintain the current restricted membership balance of sector representatives, or do we allow open membership on the Policy Working Group? Is it correct to deny an organization entry to the PWG for the reason of maintaining this originally instated balance? Does our current approach work best with adaptive management and current strategy needs?
>
> Comment (Chris Reynolds, AFT): I see no issue with adding members. There are other organizations now working toward these goals as well and I welcome new membership to the group.
>
> Comment (Rick Manne, UCSD): I agree with the general theme of adding people by conscious decision [of existing members]. Current members should be involved in yes/no type things and there should be a clear reason for the action.
>
> Question (Joan): So, establish baseline criteria for groups? For example, a group has enough activity or other criteria to be a member in the group and have a voice?
>
> Answer (Rick): Not to be possessive of seats, but I suggest a degree of a vote. What if there is a disagreement? How do we resolve a disagreement? The membership [itself] should be asking about future membership.

Comment (Holly Hudson, CMAP): I agree but are there "X" number that we want serving on the PWG? If you want 5 across the state, maybe MWRD is always there, but others are on rotation for service on the group. This could be the same with stormwater management from different counties. Open it up to more of the urban management counties and allow rotation. For example, Lake County or another urban county with stormwater departments. We could consider this too.

Comment (MJ Oviatt, Savannah Institute): Savannah Institute is not on this list, maybe one day we will be. There is a difference between point source and non-point source policy work to consider.

Comment (Trevor): We have never had a point source committee since that sector is regulated. But we have had small meetings with point source representatives to provide oversight and feedback as we are developing Illinois point source load summaries. It is an opportunity for this sector to review data and ask questions. Also, we do have subgroups focusing on issues, such as the agricultural forum. In the last few years, we've had organizations ask to be on PWG. And we have said, "No for now. We are trying to maintain the balance of the PWG as originally established. However, anyone can get on the subgroups." An example is the ag forum, AWQPF, to focus on ag issues. But still some organizations want to be on PWG. We don't want to vote and put ourselves as a group in the situation where some get in and others don't [due to divisions in voting]. Perhaps criteria establishment may work. I'm sure how much we could put together. So, we could keep it as it is, or we could just open it up to anyone. With those two options, we don't get into the position of voting. We don't have voting in PWG. The balance of voices was the original intent so one sector wasn't over-represented against another sector. I think this question of open membership is a yes/no question. I'm not sure how we would measure people against criteria.

Online comment (Albert E., MRC): We are not really voting on anything. And we do not have mobs that want to participate. This [open membership] doesn't seem to be a problem.

Online comment (Sanjay S., IFB): I support criteria approach to let new members serve on PWG.

Comment (Megan D (ICGA): I suggest cautiously looking at new members knowing anyone can already be involved and giving their opinions to the working groups. Question, Trevor, about those asking to be involved, how active they are currently. Are they showing up in the subgroups and really being engaged there?

Question (unknown): What is the advisory capacity of scientists to this group? To give us advice on some of the things we are talking about.

Answer (Trevor): scientists and science team members come talk to AWQPF when appropriate or to the PWG when needed.

Comment (Erin Bauer, ISWS): The PWG list has several municipalities. Perhaps they can rotate/trade off with others. I agree on keeping the balance and rotation may be a solution to maintain balance and allow for participation by smaller communities since I don't see any from downstate other than Springfield.

Comment (Amelia Cheek, IFB) – Add this question to the survey so we have time to think about it.

Comment (Joan): Yes, and we can add the other reflection questions about group efficacy [listed on the slide] to the survey since we missed those. Quickly though, with regards to meeting frequency and format of virtual, in person, and hybrid, is this working?

Comment (Megan D., ICGA): I like hybrid.

Online Comment (Albert Cox, MWRD): Yes, hybrid is a great option.

Online Comment (Greg McIsaac, U of I retired): I like hybrid also.

Comment (Joan): Also, two chair positions are open, and the Steering Committee invites anyone interested in serving as Communication subgroup chair or Performance Benchmark chair to email NLRS@illinois.edu.

Illinois Extension Watershed Outreach Update

Rachel Curry and Nicole Haverback, Illinois Extension

Rachel introduced herself as Extension Statewide Ag Educator and Nichole Haverback, Extension Watershed Outreach Associate. They are part of the NLRS Extension Watershed Implementation team. She began with an overview of recent and ongoing projects, one being the Nutrient Loss Reduction podcast, which is co-produced by Todd Gleason, Nicole Haverback, and herself. They are planning to release Episode 59 out by the end of this month. It will cover Marin Skidmore's and Jonathan Coppess's recent series on FarmDoc – *When it Rains, It Pours: Extreme Precipitation and Nutrient Loss*. Starting in December 2022, they also created a supplemental blog to support the podcast and have completed 19 blog posts so far. A summer intern, Sam Henry helped with these.

They produced an NLRS and Ag Conservation Fact Sheet this past July, which includes information about the NLRS lists the NLRS-recommended ag conservation practices along with their nutrient reduction efficiencies and their per acre per year cost estimates. In July 2023, Rachel also facilitated a cover crop farmer panel discussion with support from Nicole and the summer intern. The panel included three local farmers who spoke about their cover crop journeys and answered questions from the audience. It was so well-received that they planned another for the Farm Progress Show. Those interviews were recorded and were used for Episode 56 of the NLRS podcast. They are planning another for summer 2024 focused on edge-of-field practices. In the past year, the Extension Watershed Implementation team purchased two tabletop models, a bioreactor, and a saturated buffer. Other demonstration tools already included a tabletop rainfall simulator and a nonpoint source Enviroscape. Nicole and Rachel, along with several other Illinois Extension employees, received training from University of MN on how to moderate the Watershed Game with a group of stakeholders.

The team is expanding a successful cover crop grant project which was completed in Whiteside County, Illinois. Extension will continue to provide cereal rye cover crop seed, as well as oat-radish seed, to farmers. They will collaborate with Whiteside County SWCD to replicate this project in three counties in 2024. The counties will include, Whiteside and Mercer, which are both within the Mississippi North Central nitrogen-priority watershed, and Coles, which is within the Embarras (phosphorus-priority watershed. Rachel highlighted a recent webinar on ag conservation practices and shared QR codes and links to all the resources discussed. She noted that everything could be found on the new Nutrient Loss Reduction Extension Website, set to launch in early February.

Over the past year, Illinois Extension has had some changes, transitions, and additions to our NLRS Team. For those of you that aren't familiar with Illinois Extension, The University of Illinois Extension is an outreach and engagement organization that brings research-based information and education to individuals, families, and communities. It leverages the resources and expertise of the University of Illinois to address various needs and challenges, fostering learning and development across the state. At the end of June, Illinois Extension and Illinois EPA signed a new agreement to continue the work that Illinois Extension has been doing to support the NLRS. In the new agreement, the Extension team is being led by Dr. Travis Burke, Assistant Dean and program lead for

Agriculture and Agribusiness (AAB), and by Dr. Shibu Kar, Assistant Dean and program lead for Natural Resources, Environment, and Energy (NREE) and program lead for Illinois-Indiana Sea Grant. Joan Cox has transitioned to the Program Manager for the Illinois Extension NLRS Team, and Amanda Christenson was added as an NLRS Outreach Associate. Emily Steele, Media Communications Manager was hired early in 2023 to assist with Biennial Report and communications. Last year, Rachel's title changed to Extension Educator, and she shifted from being funded by the Illinois EPA agreement to being funded by Extension as a statewide position focusing on the NLRS watersheds and agricultural conservation education. Nicole Haverback, who originally served the P-priority watersheds, moved to the N-priority watersheds, and they are currently hiring a new Watershed Outreach Associate to serve the P-priority watersheds. Eliana and Layne are continuing urban stormwater work. Eliana now serves as Water Quality and Stormwater Specialist for Illinois Extension. Layne continues to focus on green infrastructure and NLRS water quality goals as a Stormwater Outreach Associate.

Rachel introduced Dr. Burke and Dr. Kar. Dr. Burke began by stating that University of Illinois and Extension understand the value of the NLRS and the partnerships within the Strategy and that Illinois Extension will continue to support the work to reduce nutrient loss and improve water quality in Illinois and downstream. The Extension Ag and Agribusiness Team remains committed to advancing education, outreach, and research related to the NLRS, as well as promoting agricultural conservation practices outlined in the Strategy. Dr. Kar spoke about the new Illinois EPA agreement, highlighting that Illinois Extension has increased its in-kind contributions to the NLRS through the work being done by Dr. Burke, Dr. Kar, Eliana, and Rachel, as well as evaluation and office support staff. Education about the NLRS and its goals are not limited to our team but are included in outreach programs provided by Illinois Extension Educators throughout the state. Natural Resources, Environment, and Energy and Illinois-Indiana Sea Grant are dedicated to education and outreach efforts focused on water quality and quantity in Illinois, with a specific emphasis on urban stormwater management.

Closing Statements

Director John J. Kim of the Illinois Environmental Protection Agency

Trevor thanked the audience, organizers, and Todd for hosting. Then he introduced Director Kim. Director Kim stated that Illinois EPA's Bureau of Water is the most active in NLRS, and the Bureau Chief, Sanjay Sofat has recently left the Illinois EPA and moved on to Illinois Farm Bureau, and they wish him well. Joey Logan-Pugh is now the acting Bureau of Water Chief. He has a great tenure at the agency, is an attorney, and has worked in the Bureau for many years under Sanjay. Director Kim went on to thank everyone for their engagement. He noted that these are challenging issues, and the goals are laudable, important, and very tough to reach. There are issues at play that make this a very dynamic landscape requiring commitment to the issues and an open mind for finding solutions. There is not going to be any one approach to solve this issue and it is going to continue to change as we understand climate change and see technology advance. The fact that so many people are in attendance is a strong sign that there is commitment to see our way through to reaching the NLRS goals.