



# Biennial Report 2019

## SUMMARY



**T**he Illinois Nutrient Loss Reduction Strategy (Illinois NLRs or the strategy), released in July 2015, was followed by the first biennial report released in August 2017. Since that time, strategy partners in the Policy Working Group and several other working groups—guided by the Illinois Environmental Protection Agency (EPA), Illinois Department of Agriculture, and University of Illinois—have continued to provide considerable support and focus to advance nutrient loss reduction. This Illinois NLRs Biennial Report 2017–18 provides a summary of these efforts.





The overall objective of the strategy is to improve water quality, not only in Illinois, but downstream, to reduce the hypoxic zone in the Gulf of Mexico. The strategy sets a long-term goal of reducing loads from Illinois for total phosphorus and total nitrogen by 45%, with interim reduction goals of 15% nitrate-nitrogen and 25% total phosphorus by 2025.

As identified in the strategy, three sectors (agriculture, point source, and urban stormwater, respectively) are sources of

nutrient loss in Illinois. For each of these sectors, measures of implementation help provide a full scope of efforts and accomplishments in the state to achieve strategy goals.

Further, Illinois has a robust water-quality monitoring network that provides data to calculate nutrient loads both within and leaving its borders. This knowledge is essential to assess progress in meeting the goals of the strategy and to identify any necessary adjustments.

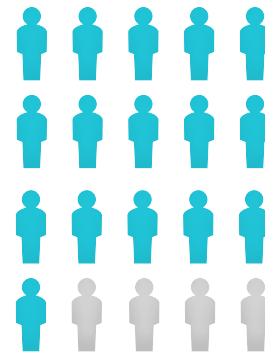




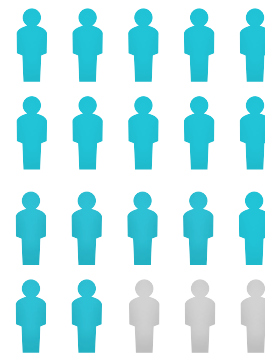
## Agriculture

The agricultural sector report is based on the premise that resources that fund and support outreach efforts lead to implementation on the land, which results in water quality improvements.

The agricultural sector partners reported that in 2017 \$25,291,318.50 was invested in nutrient-loss-reduction efforts and in 2018 \$33,941,940.67 was invested. Agricultural organizations sponsored hundreds of events for farmers, agricultural retailers, and the public about practices that can reduce nutrient loads in Illinois waters. In 2017-18, they had nearly 84,500 attendees at these events. In addition to face-to-face interactions, agricultural organizations sponsored multi-media campaigns to provide information about the strategy and its implementation. Illinois NLRS was featured in newsletters, factsheets, newspaper articles, and on radio programs. The Illinois NLRS survey conducted by the U.S. Department of Agriculture National Agricultural Statistics Service (NASS) showed that most farmers have at least some knowledge about best management practices listed in the strategy. Approximately 80% said that they were knowledgeable about nutrient management or constructed wetlands and 85% knew about cover crops.



Approximately **80%**  
of respondents said that they  
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**cover crops**



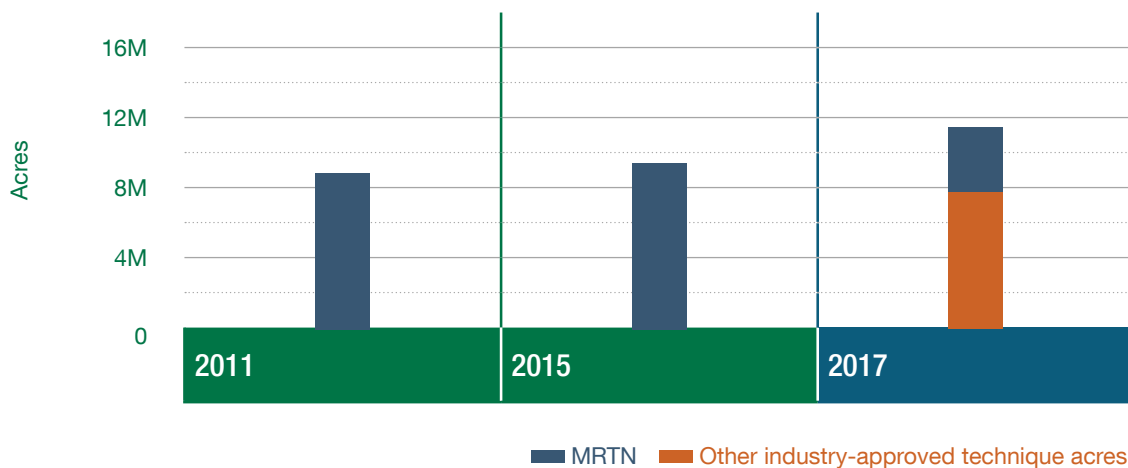
As for what is happening on the land, the survey results in Table 1.1 and Figure 1.1 show that on one-third of their 2017 corn acres, producers used the Maximum Return to Nitrogen (MRTN) strategy to help determine the amount of nitrogen to apply. In addition, producers used other industry-recommended techniques on 69% of their corn acres. In 2017, many producers considered two or more strategies before applying nitrogen to some corn

acres, therefore, the sum of percentages in Table 1.1 is greater than 100.

It appears that agricultural stakeholder interest and activities have remained high despite limited public resources that have been available to support new initiatives. Stakeholders have continued to successfully, and effectively, redirect and re-target their existing programs and resources to NLRS actions.

**Table 1.1. Acres with a nitrogen management strategy**

	Acres in 2011	Acres in 2015	Acres in 2017
Acres of corn planted	12,600,000	11,700,000	11,200,000
Acres where an MRTN strategy was used to determine application rates	8,820,000 or 70% of planted acres	9,430,000 or 81% of planted acres	3,730,000 or 33% of planted acres
Other industry-approved technique acres	Not asked	Not asked	7,750,000 or 69% of planted acres



**Figure 1.1. Acres with a nitrogen management strategy**

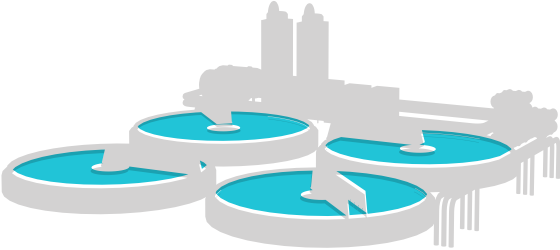


Photo courtesy of MWRDGC

### Point Source

One of the strategy’s interim goals is a 25% reduction in phosphorus discharges by 2025. Annual statewide total phosphorus loads from point sources have been reduced by 4.3 million pounds, when comparing 2018 discharges with 2011 baseline year levels. This represents a 24% reduction in phosphorus from point sources.

As the strategy was developed, the expectation was that, due to ongoing work at several significant wastewater treatment facilities across the state, reductions were imminent. This proved to be true. By the end of 2018, as construction projects were completed, in particular at the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), Sangamon County Water Reclamation District (serving the greater Springfield area), and Greater Peoria Sanitary District, as well as other facilities across Illinois, the point source sector achieved 96% of its interim reduction goal.



Annual statewide total phosphorus loads from point sources have been **reduced by**

**24%**



**6,000 people**  
were reached at **stormwater outreach events** in 2018

## Urban Stormwater

Tracking the urban stormwater sector’s strategy implementation activities is now getting underway as part of the state’s reporting efforts. One vital measure of success for this sector is outreach—for example, in 2018, 6,000 people were reached at face-to-face events primarily held in DuPage County. The MWRDGC collaborative project called Space to Grow transforms Chicago schoolyards into vibrant green spaces and provides another way to assess progress in this sector. Collectively, the project’s four pilot sites have a design retention capacity of 731,004 gallons per rain event. Plans are in the works to expand the program to 30 more schools.

Illinois Extension conducted a review of 287 Annual Facility Inspection Reports from Municipal Separate Storm Sewer Systems (MS4s) to summarize urban stormwater implementation. Results show that dry weather screening and street sweeping programs were the most often used physical practices. Green Infrastructure (GI) practices were also listed by many communities. Figure 1.2 depicts the distribution of communities and number of GI practices and funding programs reported by them.

Number of GI Practices in Illinois MS4 Communities

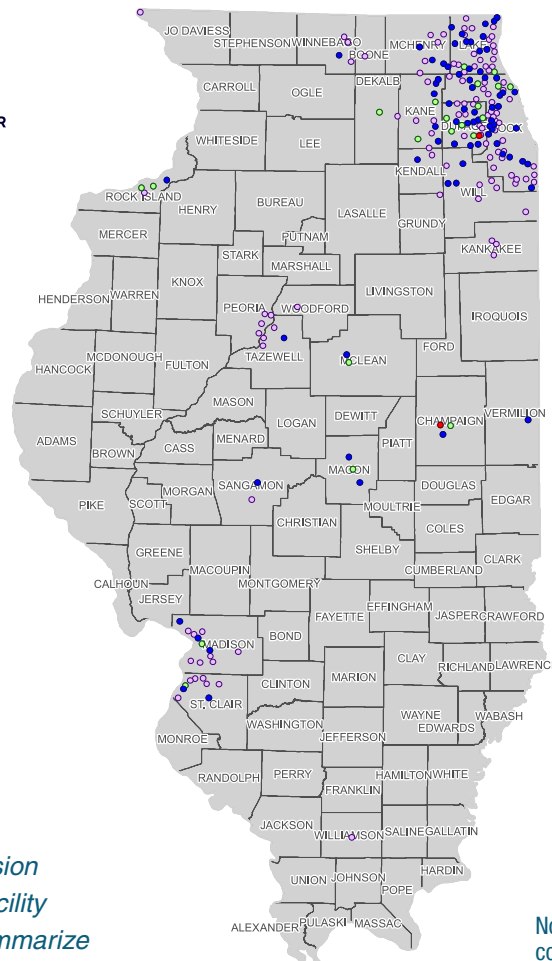
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#### Number of GI Practices

- 5 or More
- 3-4
- 1-2
- 0



**Figure 1.2.** Illinois Extension reviewed MS4 Annual Facility Inspection Reports to summarize urban stormwater implementation

Note: The unincorporated communities of Ingleside and Mossville are also MS4 communities

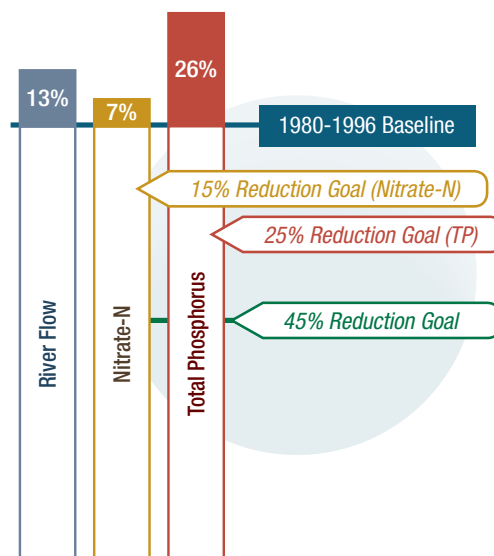


## Science Assessment Update

The Illinois NLRs Science Assessment Update reports on estimated and quantified changes in riverine nitrate–nitrogen and total phosphorus loads and yields in Illinois. Data sources included river–flow data from the U.S. Geological Survey (USGS) and concentration data from Illinois EPA, USGS, MWRDGC, Fox River Study Group, and University of Illinois, to calculate nitrate–nitrogen and total phosphorus loads for the eight major rivers draining Illinois through the 2017 water year and to estimate aggregated statewide annual losses. Calculations were also done at the eight–digit Hydrologic Unit Code (HUC8) watershed scale.

For the five–year period of 2013–17, the statewide water flow, nitrate–nitrogen loads, and total phosphorus loads were estimated to be 13%, 7%, and 26%, respectively, above the 1980–96 baseline period (Figure 1.3). Much of the increase in the nitrate load occurred in the Rock River, while much of the increase in total phosphorus load occurred in the Illinois River.

Illinois EPA provided point source discharges of total nitrogen and total phosphorus for 2017. Statewide, point source total nitrogen discharge was about 75 million lb/yr, or about 14%, less than the 2011 estimate. Point source total phosphorus discharge for 2017 was estimated to be 14 million lb/yr, or about 22%, less than the 2011 estimate of 18.1 million lb/yr.



**Figure 1.3.** Percent increase from baseline to average 2013–2017

Nitrate and total phosphorus yields were also estimated for the HUC8 watersheds:

- In general, 2012–17 nitrate–nitrogen yields were similar to values calculated for 1997–2011.
- For watersheds with nitrate–nitrogen yield greater than 11 lb N/ac–yr, changes in nitrate yield were correlated with change in water yield.
- For three watersheds in northwest Illinois (Mackinaw River, Spoon River, and Flint–Henderson) some reduction in nitrate–nitrogen yield appears to be independent of water yield changes.
- Changes in estimation methods used for the Lower Illinois River and Lower Sangamon River resulted in lower estimates of nitrate–nitrogen loads for these watersheds.
- Reductions in total phosphorus yield in Chicago and Des Plaines River watersheds between 15% and 27% corresponded to reductions in point source discharges in those watersheds.
- Conversely, increases in total phosphorus yield were calculated for the Upper Sangamon River, Macoupin Creek, and several other watersheds.



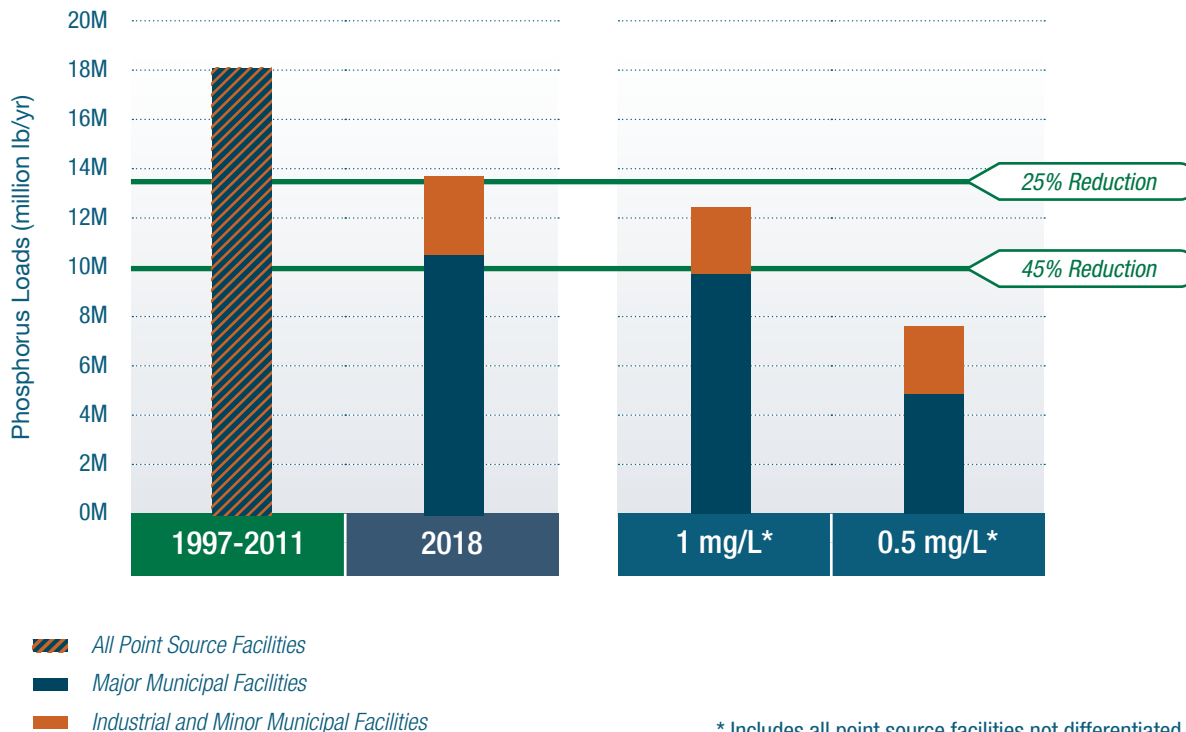
## Adaptive Management

Adaptive management involves learning and adapting to new research, monitoring, and policy information as it affects the decision-making process. Including adaptive management as an integral component to the overall strategy helps ensure that Illinois NLRS is a living document, remaining relevant to all stakeholders over time and focused on traditional and new activities that can enhance both in-state and Gulf of Mexico water quality. Determining sector implementation status, as compared to nutrient reduction goals discussed in the strategy, can be a first step in adaptive management.

Figure 1.4 shows the 1997–2011 updated baseline load of 18.1 million lb/yr from all point sources. The 2018 annual total phosphorus load from 213 major municipal

point source facilities was approximately 11 million lb/yr and from industrial and minor municipal point sources was 2.7 million lb/yr. Currently, 65 major municipal facilities are required to meet a 1 mg/L total phosphorus concentration limit in their respective permits. In the next few years, eight more major municipal facilities are on schedule to meet a 1 mg/L total phosphorus concentration. The graph shows an estimate of future annual total phosphorus loads from the point source sector if all major municipal facilities meet 1 mg/L and 0.5 mg/L total phosphorus concentrations, respectively. It assumes that the industrial and minor municipal point source level remains steady.

The estimated reductions are conservative because the calculations assume that facilities are discharging at their design average flows while, in reality, many facilities discharge less than that.



**Figure 1.4.** Total phosphorus (point source load), estimated future total phosphorus (point source load)



## Acknowledgments

### Steering Committee

Warren Goetsch, *Illinois Department of Agriculture*  
Sanjay Sofat, *Illinois Environmental Protection Agency*  
Christine Davis, *Illinois Environmental Protection Agency*  
Trevor Sample, *Illinois Environmental Protection Agency*  
C. Eliana Brown, *University of Illinois Extension, Illinois-Indiana Sea Grant*

### Facilitation and Coordination Team

C. Eliana Brown, *University of Illinois Extension, Illinois-Indiana Sea Grant*  
Kate Gardiner, *University of Illinois Extension*  
Tony Heath, *University of Illinois Extension*  
Irene Miles, *Illinois-Indiana Sea Grant*  
Joel Davenport, *Illinois-Indiana Sea Grant*  
Ethan Chitty, *Illinois-Indiana Sea Grant*  
Hope Charters, *Illinois-Indiana Sea Grant*

### Policy Working Group Organizational Members

- » American Bottoms Regional Wastewater Treatment Facility
- » American Farmland Trust
- » Aqua America
- » Association of Illinois Soil and Water Conservation Districts
- » Bloomington & Normal Water Reclamation District
- » City Water, Light, and Power
- » Downers Grove Sanitary District
- » Environmental Law & Policy Center

- » GROWMARK
- » Illinois Association of Drainage Districts
- » Illinois Corn Growers Association
- » Illinois Department of Agriculture
- » Illinois Department of Natural Resources
- » Illinois Environmental Protection Agency
- » Illinois Environmental Regulatory Group
- » Illinois Farm Bureau
- » Metropolitan Water Reclamation District of Greater Chicago
- » Nutrient Research & Education Council
- » Prairie Rivers Network
- » Sierra Club
- » The Nature Conservancy
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*Photo courtesy of C. Eliana Brown*