Can Illinois reach its water quality goals?

Meeting the Challenge of Nutrient Loss Reduction in the Ag Sector

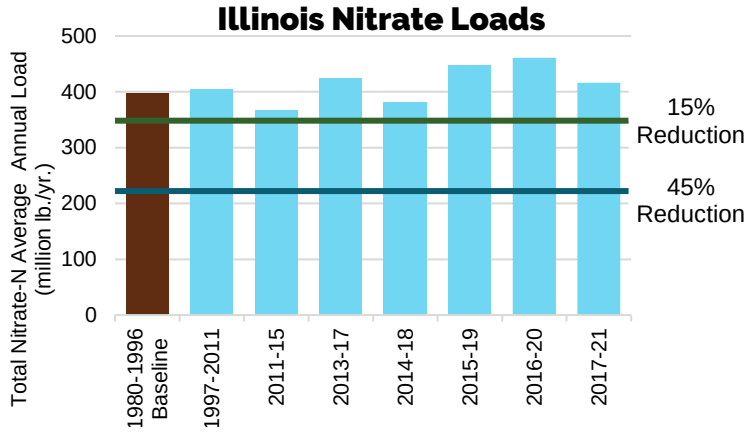
The IL Environmental Protection Agency (IEPA) and the IL Department of Agriculture (IDOA) released the ***Nutrient Loss Reduction Strategy (NLRS)*** in 2015, and in it quantified nutrient loads from **multiple sources** and set aggressive **reduction targets** for the amounts of nitrate-nitrogen (NO_3-N) and total phosphorus (TP) leaving the state. The strategy laid out best practices to achieve reductions, including interim reductions to be achieved by 2025. Recently, the **2023 NLRS Biennial Report** was released, describing activities from 2015 through 2022.

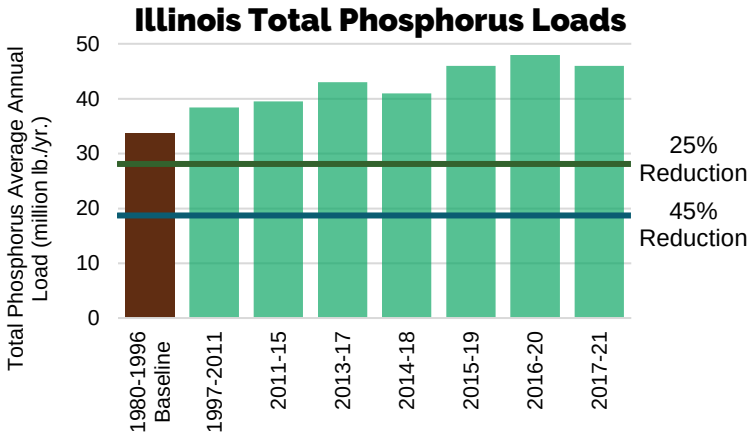
This overview from the IL Sustainable Ag Partnership (ISAP) is designed to build awareness of the NLRS among farmer and advisor audiences, highlight challenges in meeting NLRS targets, and connect users to a variety of ISAP and partner resources to support conservation learning and action.

Key Findings - 2023 Biennial Report:

Illinois is not on track to meet the interim (2025) goals of the NLRS.

- Monitoring data illustrate the 2017-2021 five-year average values for **nitrate-nitrogen and total phosphorus loads are 4.8% and 35% above the 1980-1996 baseline**, respectively. For this same period, river flow is 23% above the baseline.
- While overall nutrient loads remain high, **point source contributors have successfully reduced their total phosphorus loads by 34%** via National Pollution Discharge Elimination System (NPDES) permit limits.
- Despite significant investment and effort, **nutrient losses attributed to the nonpoint sector, including agriculture, are increasing**. Researchers are studying how various factors such as climate variability, legacy nutrients, and increased drainage may be contributing to these increases.
- **Levels of conservation practice adoption have increased, but not at the pace or scale needed to meet NLRS targets.**





How much conservation is needed?

The NLRS presents several **scenarios** to illustrate the types of interventions needed to meet interim and long-term NLRS targets. While not prescriptive, each scenario depicts an example suite of conservation practices and the estimated percentage of agricultural land on which each practice is needed.

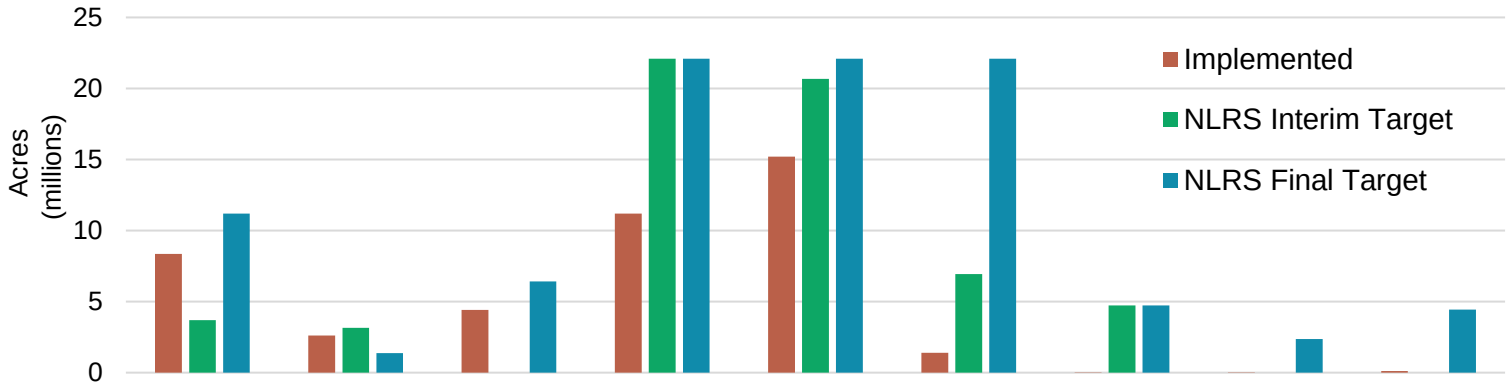
For example, the NLRS's **Interim Target (NP7)** and **Final Target (NP8) Scenarios** include 6-9 practices, some of which are needed on nearly all farmed acres to achieve NLRS water quality goals. Additional modeling is needed to understand how these estimates should be adjusted to account for changes in precipitation and water yield.

Practice	Acres where applicable	Interim (NP7)	Final (NP8)
MRTN	Corn	16.7%	50.7%
N Inhibitor	Corn	14.2%	6.2%
Fall/Spring Split N	Corn	n/a	29.1%
Soil Test Phosphorus	Corn/soy	100%	100%
Conservation Tillage	Corn/soy	93.5%	100%
Cover Crops	Corn/soy	31.4%	100%
Bioreactors	Tile-drained	21.4%	21.4%
Constructed Wetlands	Tile-drained	n/a	10.7%
Buffers & Filter Strips	Corn/soy	n/a	20.1%

Calculations are based on NLRS Scenario NP7 and NP8 treatment acres found in Christianson 2020, divided by the 2011 benchmark value for corn and soybean acreage (22.1M acres).

Agricultural Conservation Practice Implementation

Each NLRS biennial report presents information on the implementation of conservation practices, shown below with the target acres from plausible NLRS interim and final practice scenarios included for context. The list of practice options is not exhaustive.



	MRTN	N Inhibitor	Fall/Spring Split N	Soil Test Phosphorus	Conservation Tillage	Cover Crops	Bioreactors	Constructed Wetlands	Buffers & Filter Strips
Nitrate ↓ (%/ac)	10	10	7.5-10	-	-	30	25	50	90
Total Phosphorus ↓ (%/ac)	-	-	-	7	50	30-50	-	-	50
Implemented (Acres)	8.4M	2.6M	4.4M	11.2M	15.2M	1.4M	1449	421	97,749
Interim Target (Acres)	3.7M	3.1M	-	22.1M	20.7M	6.9M	4.7M	-	-
Final Target (Acres)	11.2M	1.4M	6.4M	22.1M	22.1M	22.1M	4.7M	2.4M	4.4M

Practice Notes

NUTRIENT MANAGEMENT

- Use of MRTN and soil test phosphorus to determine application rates, nitrification inhibitor with fall N, and split fall/spring N applications are increasing.

COVER CROPS

- Adoption stands at 20% of the interim goal and just 6% of the long-term goal.
- Significant financial and technical assistance are needed to provide hands on support to farmers making this management change.

EDGE OF FIELD PRACTICES

- Implementation is occurring at a fraction of the level needed to meet NLRS goals.
- Building associated treatment practices into the increasing amounts of drainage installation is critical to success.

Which solutions are right for your farm?

IL is approaching a critical point in the implementation of the NLRS – the interim target date of 2025 – and the agriculture sector and its partners must demonstrate that collective investments in conservation, outreach, and education can achieve desired impacts on water quality. For the voluntary adoption model to be successful, each farmer or landowner, with the help of trusted advisors, must evaluate nutrient loss reduction opportunities for his or her operation.

Multiple resources and programs from the IL Sustainable Ag Partnership (ISAP) are available to assist farmers, landowners, advisors, and other ag-facing audiences in reducing nutrient losses: www.ilsustainableag.org.

REFLECT

Am I:

- Following recommended soil health, tillage, and nutrient management guidelines?
- Farming marginal acres that may be better suited for conservation?

Do I have:

- Unbuffered streams or drainage ditches? Untreated tile outlets?

LEARN

- Attend a soil health or conservation drainage training.
- Join a monthly IL Cover Crop On-Farm Network call.
- Review *An Introduction to Soil Health Practices* and other ISAP or partner resources.

ACT

- Fill out a STAR form to assess soil and nutrient loss management practices on individual fields.
- Locate a specialist using ISAP's Conservation Story Map, or create a profile to share your expertise with others.
- Evaluate incentive program opportunities for cover crops and edge of field practices.
- On rented land, integrate conservation practices using lease addendums, for example via https://farmdoc.illinois.edu/agricultural-law.
- Call or visit your local USDA Service Center to get started with a conservation program.