ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

Improving our water resources with collaboration and innovation

Illinois Department of Agriculture

Illinois Environmental Protection Agency

Illinois Extension
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Lake Defiance at Moraine Hills State Park
Courtesy of Holly Hudson, Chicago Metropolitan Agency for Planning

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

Key Points

- Overview of Illinois NLRS
- Gulf Hypoxia
- Nutrient Strategy Framework
- Illinois Process
  - Science Assessment
  - Policy Working group
  - Priorities & Approach
- Implementation of NLRS
- 2023 Biennial Report

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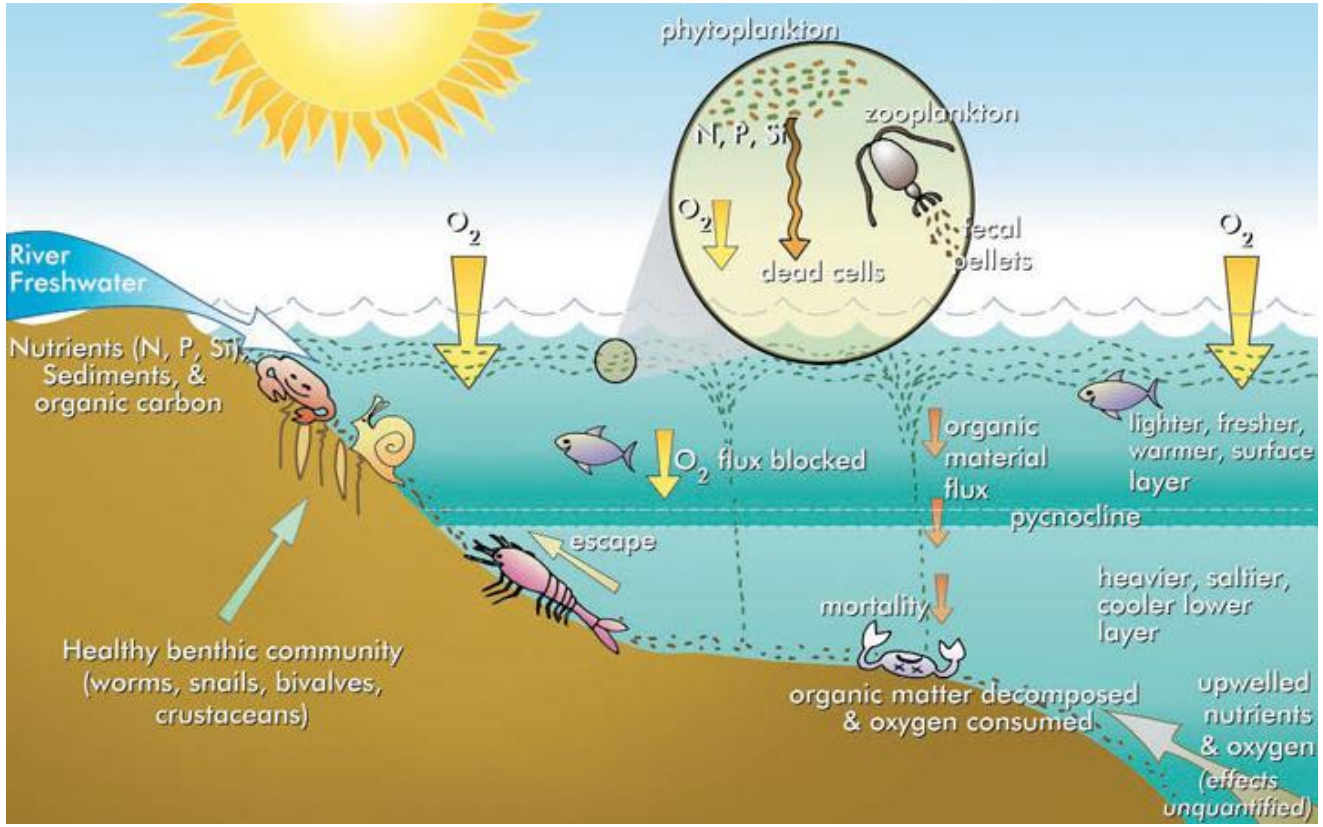
What causes hypoxia?

- Freshwater discharge and nutrient loading of the Mississippi River
- Nutrient-enhanced primary production, or eutrophication
- Decomposition of biomass by bacteria on the ocean floor
- Depletion of oxygen due to stratification



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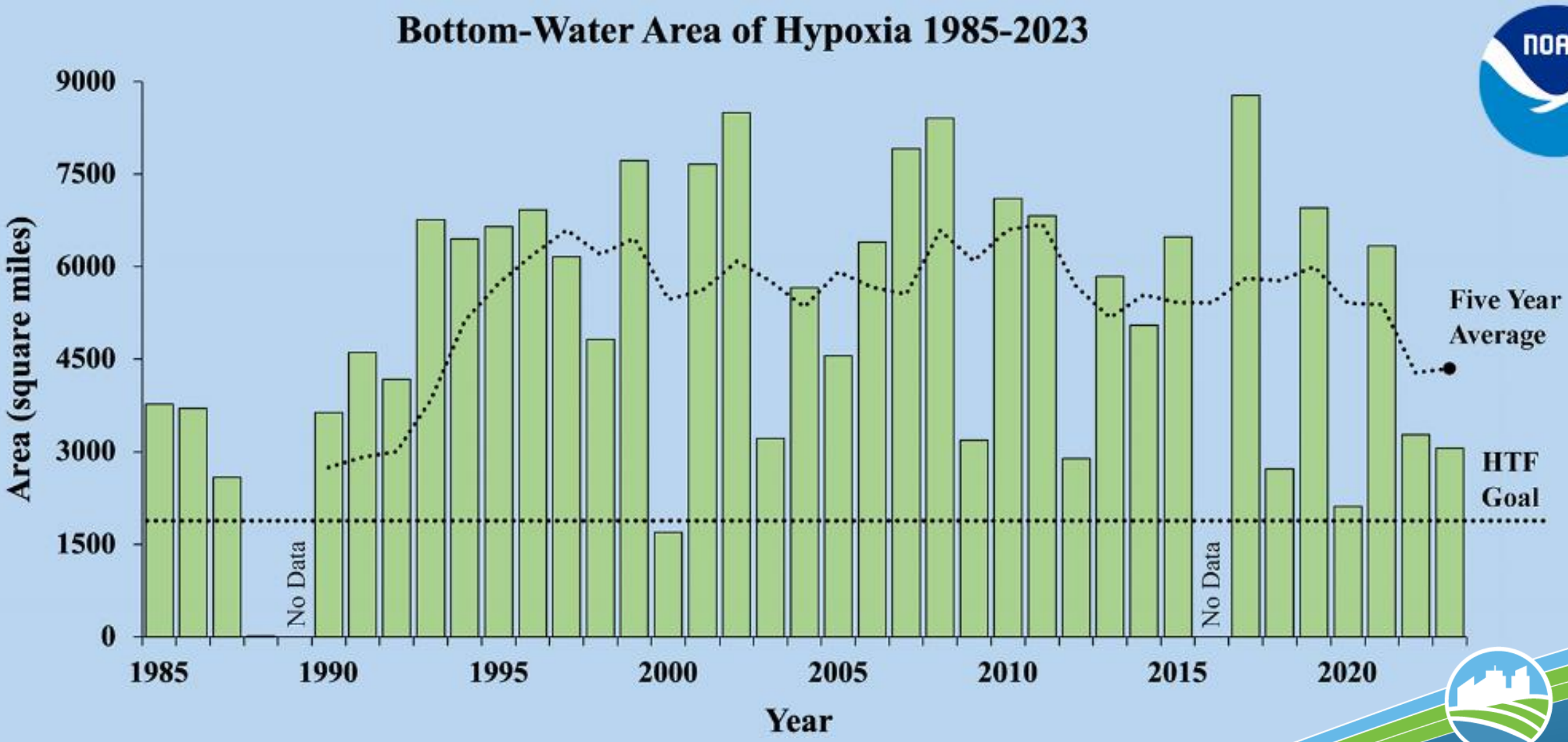
Gulf of Mexico



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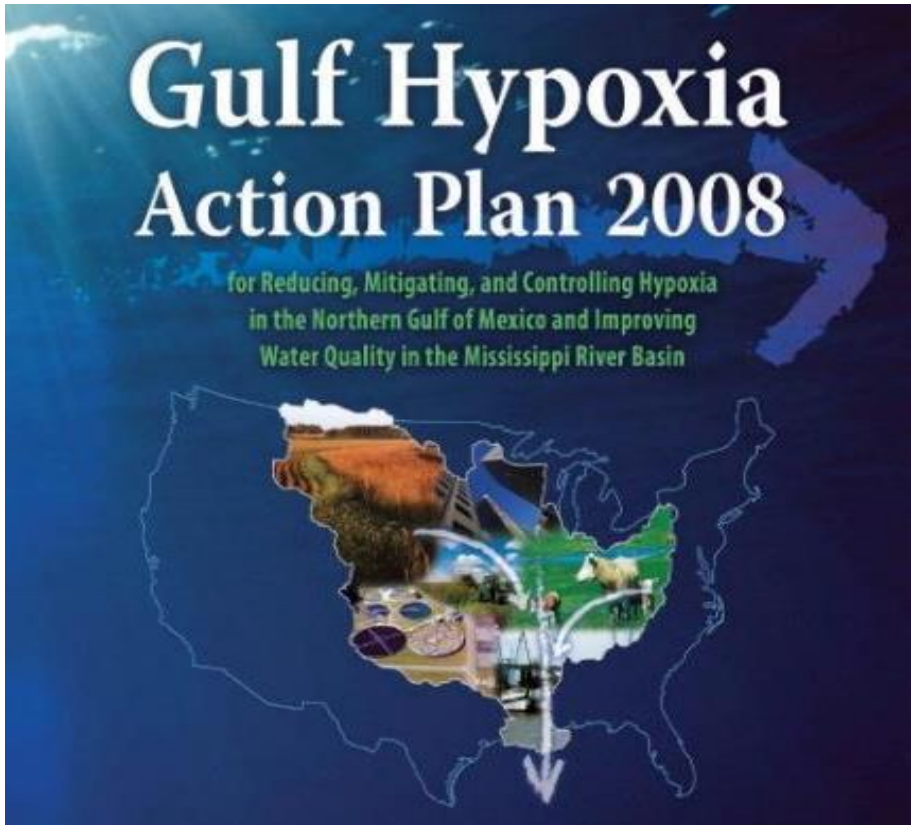
Gulf Hypoxia Task Force Study

- **Goal:**
  - Reduce Hypoxic Zone 1,930 sq mi
  - Reduce Nutrient Loading to Gulf of Mexico
  - **Reduce Total Phosphorus and Total Nitrogen load by 45%**
- **Plan was later amended**
  - 20% reduction by 2025
  - 45% reduction by 2035



USEPA Nutrient Strategy Elements

1. Prioritize watersheds for nitrogen and phosphorus loading reductions
2. Set watershed load reduction goals based upon best available information
3. Ensure effectiveness of point source permits in priority sub-watersheds
4. Agricultural Areas
5. Stormwater (non-MS4) and Septic Systems
6. Accountability and verification measures
7. Annual reporting of implementation and biennial reporting of load reductions
8. Develop work plan and schedule for numeric nutrient criteria development

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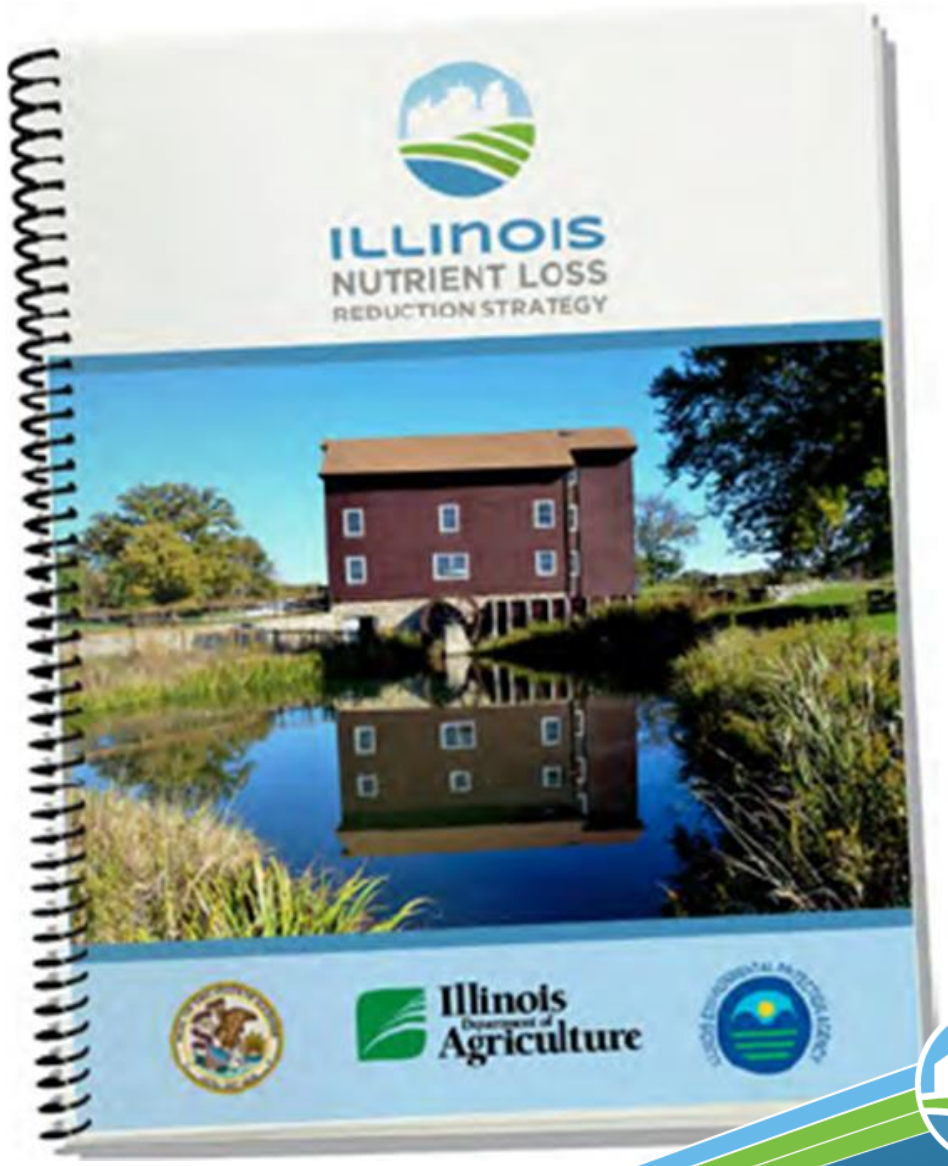
Illinois Nutrient Loss Reduction Strategy

RELEASED JULY 2015



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Illinois Nutrient Loss Reduction Strategy

GOALS

Establishes 45% Reduction of Nitrogen and Phosphorus

Interim Milestone—2025

25% Reduction in Phosphorus Loads

15% Reduction in Nitrate-Nitrogen Loads

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Illinois Nutrient Loss Reduction Strategy

Addresses nutrient loads from:

Agriculture

Point Sources
(wastewater treatment facilities)

Urban Stormwater

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Illinois NLRS Science Assessment

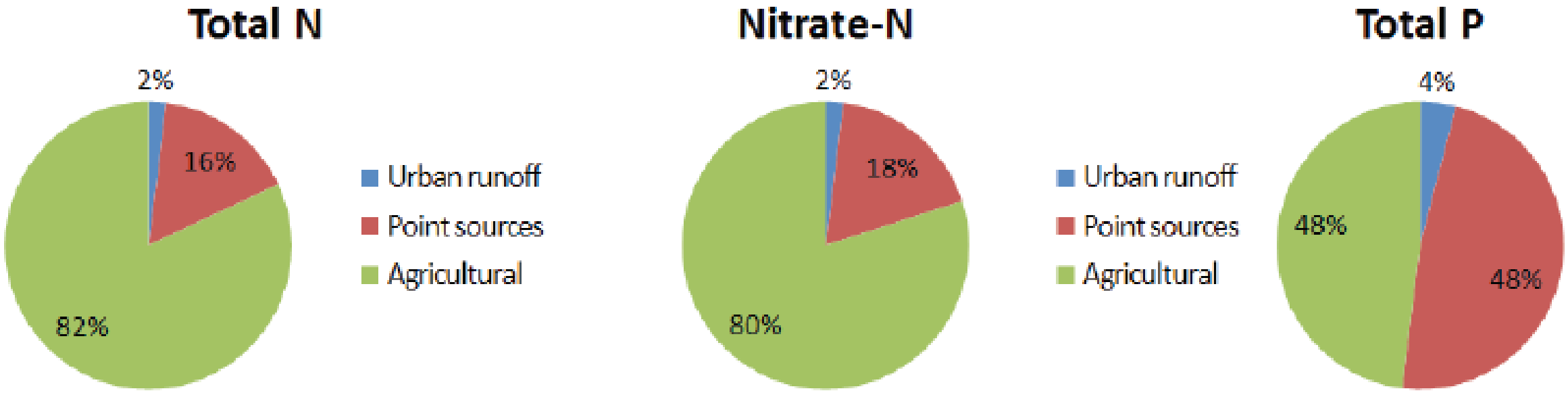

Figure 2.1. The proportion of nitrate and total phosphorus lost to the Mississippi River by source.

(Illinois Nutrient Loss Reduction Strategy, 2015)

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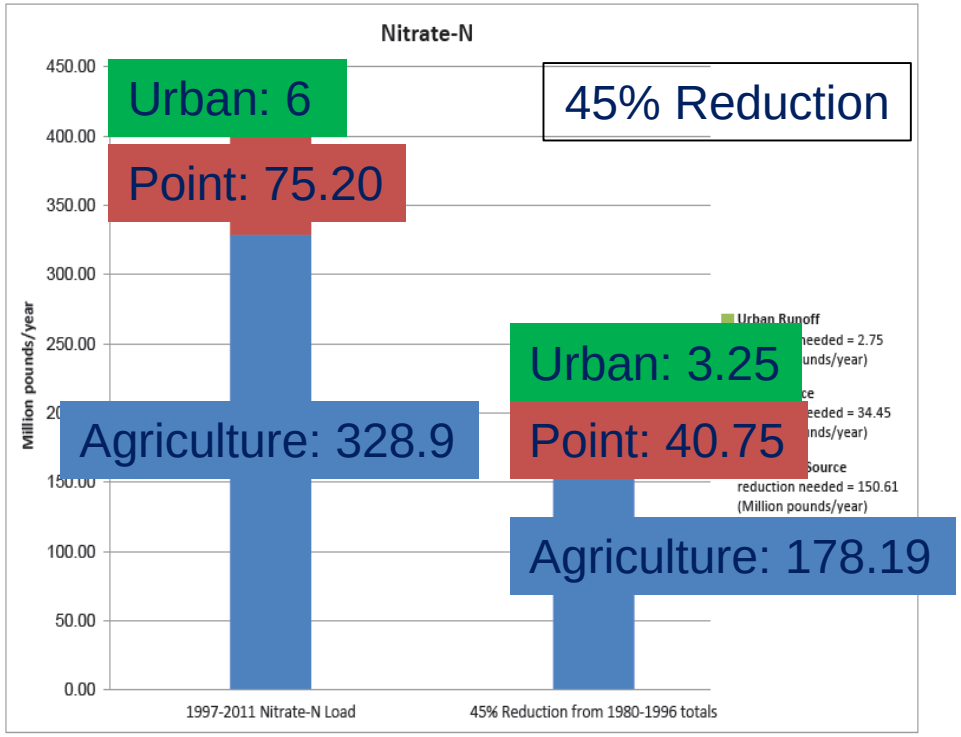
Nutrient Sources (Million Pounds Per Year)

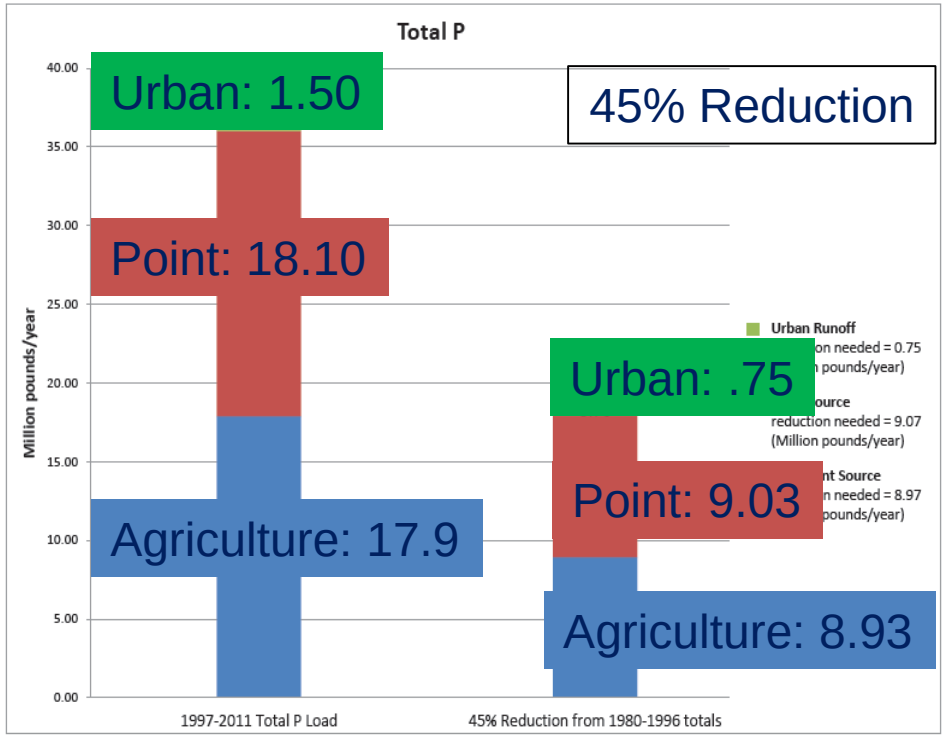


Total: 410 M lbs/yr

Baseline

Total: 222 M lbs/yr

Goal



Total: 37.5 M lbs/yr

Baseline

Total: 18.7M lbs/yr

Goal

(Illinois Nutrient Loss Reduction Strategy, 2015)

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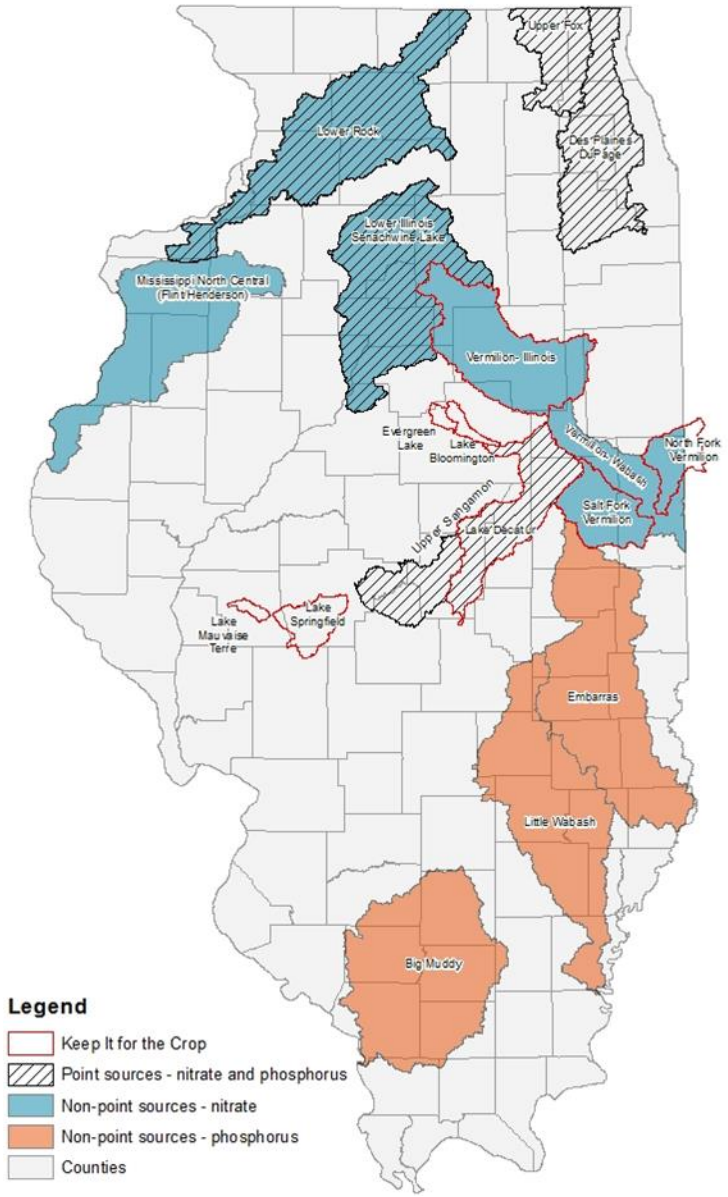
NLRS- Priority Watersheds



Prioritized by:

- Total loads (N or P)
- Local water quality concerns
- Active watershed plans

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Example Statewide Implementation Scenarios

Name	Combined Practices and/or Scenarios	Nitrate-N (% reduction)	Total P (% reduction)	Cost of Reduction ($/lb)	Annualized Costs (million $/year)
NP1	MRTN, fall to spring, bioreactors 50%, wetlands 25%, no P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, buffers on all applicable lands, point source to 1.0 mg TP/L and 10 mg nitrate-N/L	35	45	**	383
NP2	MRTN, fall to spring, bioreactors 50%, no P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, cover crops on all CS, point source to 1.0 mg TP/L and 10 mg nitrate-N/L	45	45	**	810
NP3	MRTN, fall to spring, bioreactors 15%, no P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, cover crops on 87.5% of CS, buffers on all applicable lands, perennial crops on 1.6 million ac >T, and 0.9 million additional ac.	45	45	**	791
NP4	MRTN, fall to spring N, bioreactors 35%, no P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, buffers on 80% of all applicable land	20	20	**	48
NP5	MRTN, fall to spring N, bioreactors 30%, wetlands 15%, no P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, point source to 1.0 mg TP/L and 10 mg nitrate-N/L on 45% of discharge	20	20	**	66
NP6	MRTN, fall to spring N, no P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, cover crops on 1.6 million ac eroding >T and 40% of all other CS	24	20	**	244

NLRS Implementation Recommendations: Agriculture

Practice Type	Nitrate	Total Phosphorus
In Field Practices	**Nitrogen Management** (MRTN, Inhibitors, Split Applications) **Cover Crops**	**Reduced Tillage** (no-till, strip till) **Nutrient Management** **Cover Crops** **Terraces** **WASCOBs**
Edge of Field Practices	**Woodchip Bioreactors** **Stream Buffers** (non-tile drained land) **Constructed Wetlands** **Saturated Buffers**	**Stream Buffers**
Land Use Change	**Perennial/Energy Crops**	**Perennial/Energy Crops**

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NLRS Implementation Recommendations: Urban Stormwater

- Municipal Separate Storm Sewer System (MS4) Permits
- Prioritize Green Infrastructure
- Technical and Financial Assistance for Green Infrastructure
- Urban Streambank Stabilization and Restoration
- Encourage Stormwater Collaboratives

Photo: Forest Preserve District of DuPage County

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NLRS Implementation Recommendations: Point Sources

- National Pollutant Discharge Elimination System (NPDES) Permits
- Administered by Illinois EPA
- Total Phosphorus limits for major (> 1 MGD) wastewater treatment facilities
- Feasibility and Optimization studies for nutrient removal
- Nutrient Assessment Reduction Plans
  - 1.0 mg/L total phosphorus
  - 0.5 mg/L total phosphorus
- Encourage Urban Watershed Planning Groups

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NLRS Committee Structure

- Policy Working Group
- Communications Subgroup
- Agriculture Water Quality Partnership Forum
  - Technical Subgroup
- Urban Stormwater Working Group
  - Education Subgroup
  - Tracking Subgroup
- Performance Benchmark Working Group
- Nutrient Monitoring Council
- Nutrient Science Advisory Committee
  (has completed its objective and no longer meets)

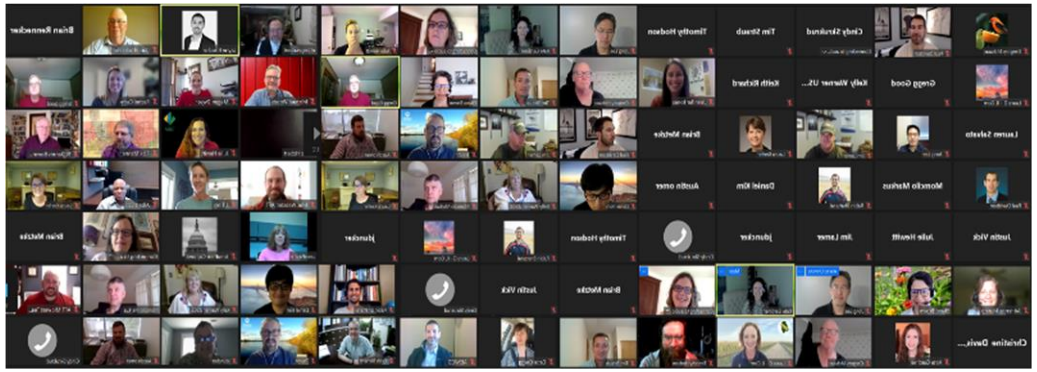

Photo: Kate Gardiner

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Illinois NLRS Policy Working Group Participants

Agriculture

Illinois Corn Growers Association

Illinois Farm Bureau. Farm. Family. Food.

Illinois Fertilizer & Chemical Association
Supply • Service • Stewardship

Illinois NREC

Illinois Pork Producers
Generations of Commitment

IADD

GROWMARK

Point Source

Downers Grove Sanitary District

IERG

UCSD

American Bottoms PChem

Bloomington Normal Water Reclamation District

Stormwater and Potable Water System

City Water, Light and Power Springfield, IL

The County of DuPage Wheaton, Illinois

Government

Illinois Environmental Protection Agency

Illinois Department of Agriculture

Illinois Department of Natural Resources

University of Illinois Urbana-Champaign
Extension
Department of Agriculture
Department of Natural Resources

USDA Natural Resources Conservation Service

Environment/Conservation

Sierra Club Illinois Chapter

Association of Illinois Soil & Water

The Nature Conservancy

prairierivers network

Environmental Law & Policy Center

American Farmland Trust

Mississippi River Collaborative

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Biennial Reports

Every two years a Biennial Report will be written to document progress of implementing the NLRS.

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Tracking Measures

Biennial Reports are structured to report data on these tracking measures by each sector.

The NLRS Logic Model

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2023 Biennial Report

(2021-2022 Reporting Years)

Released December 1, 2023

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2023 NLRS Biennial Report

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CHAPTER 3
SCIENCE ASSESSMENT UPDATE

Photo: USGS

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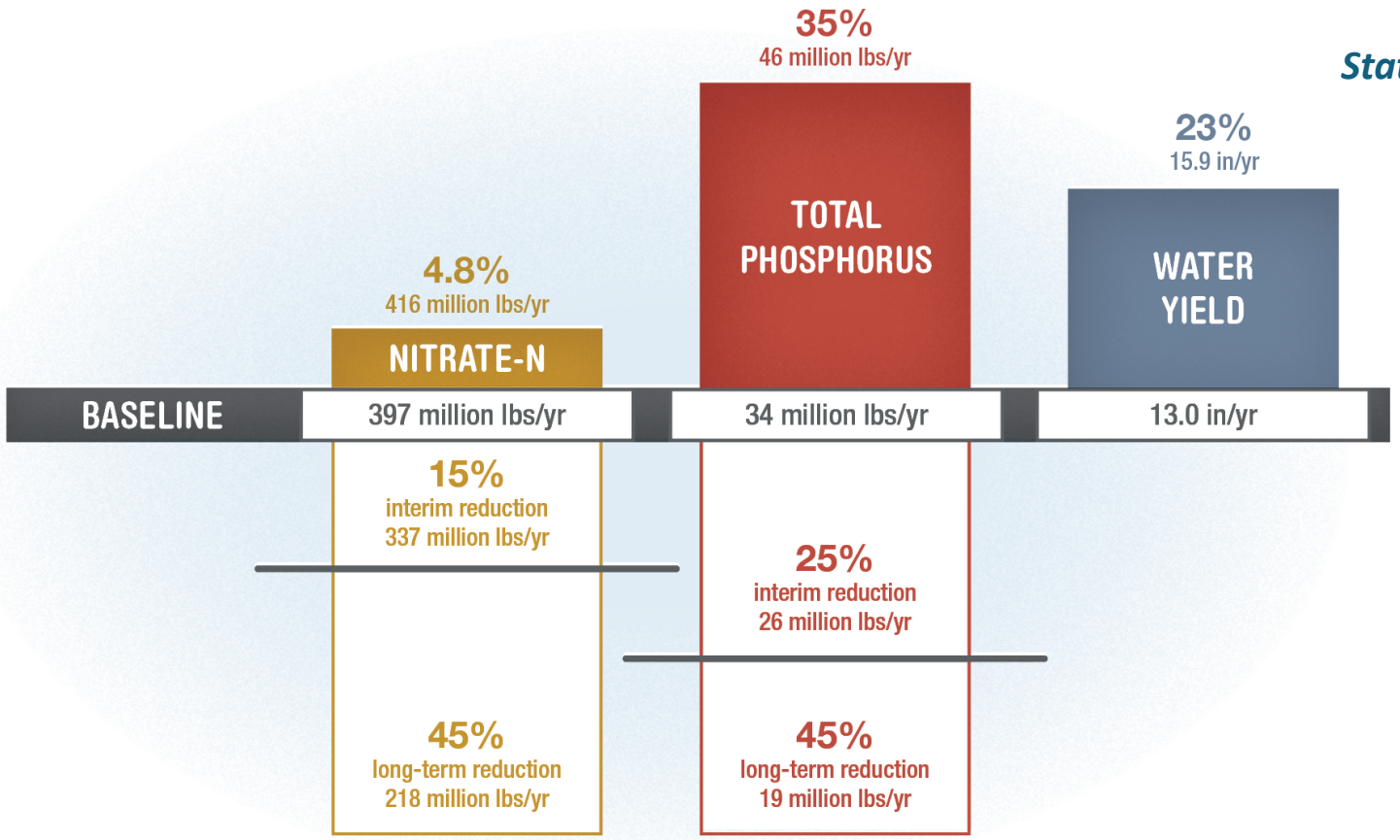
Water Quality Goals: Baseline and Current Status



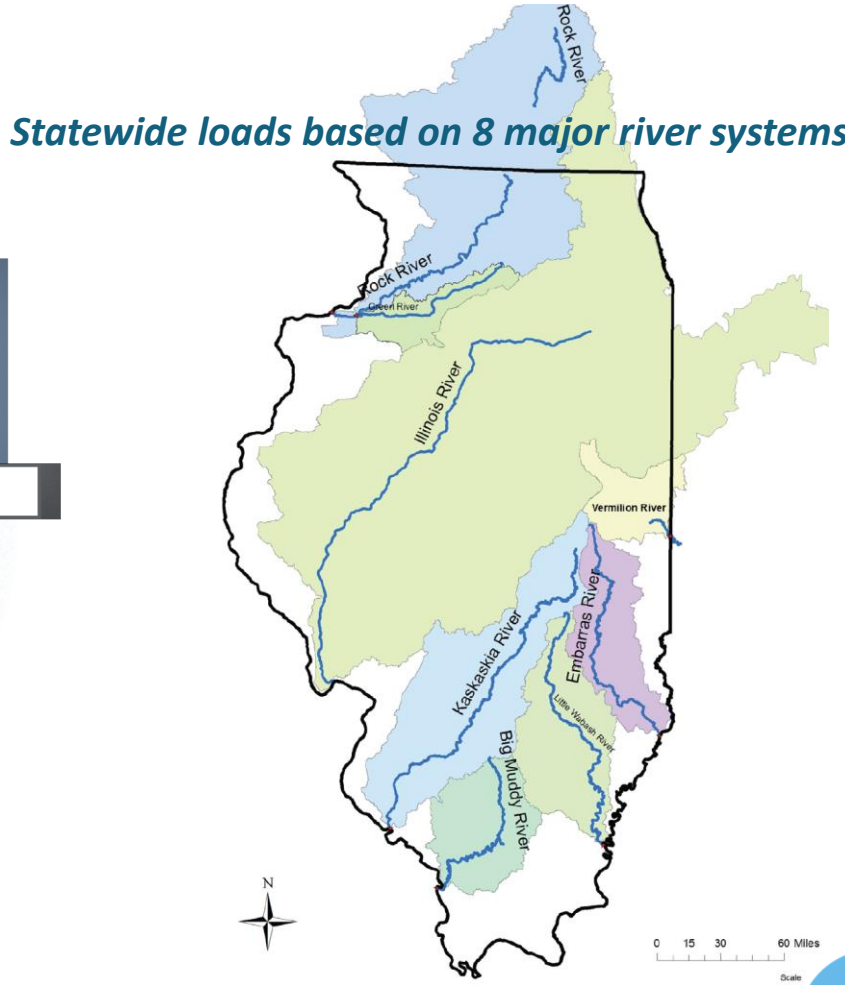


Figure 1.1 *Quantities and percent increases of recent five-year averages (2017–21) of nitrate-nitrogen, total phosphorus, and water yield relative to baseline and to interim and long-term NLRS goals in Illinois.*

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Development of additional Implementation Scenarios

Scenario NP7 Interim Reduction Goals

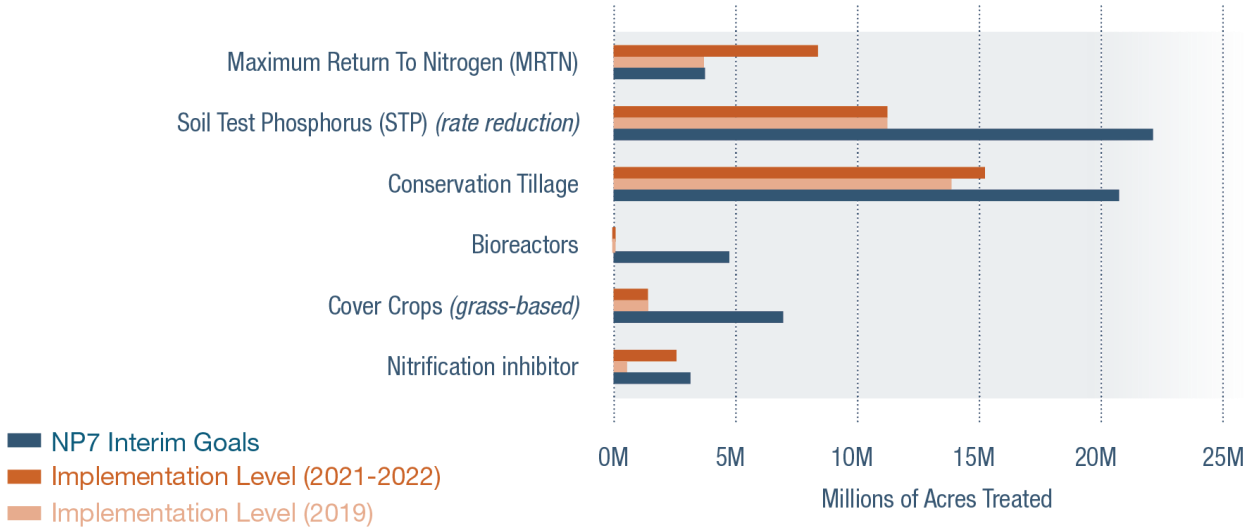

Figure 8.5. *Agricultural implementation as compared with scenario NP7. Scenario NP7 represents the level of practice adoption needed to meet 2025 interim reduction goals.*

Scenario NP8 45% Reduction Goals

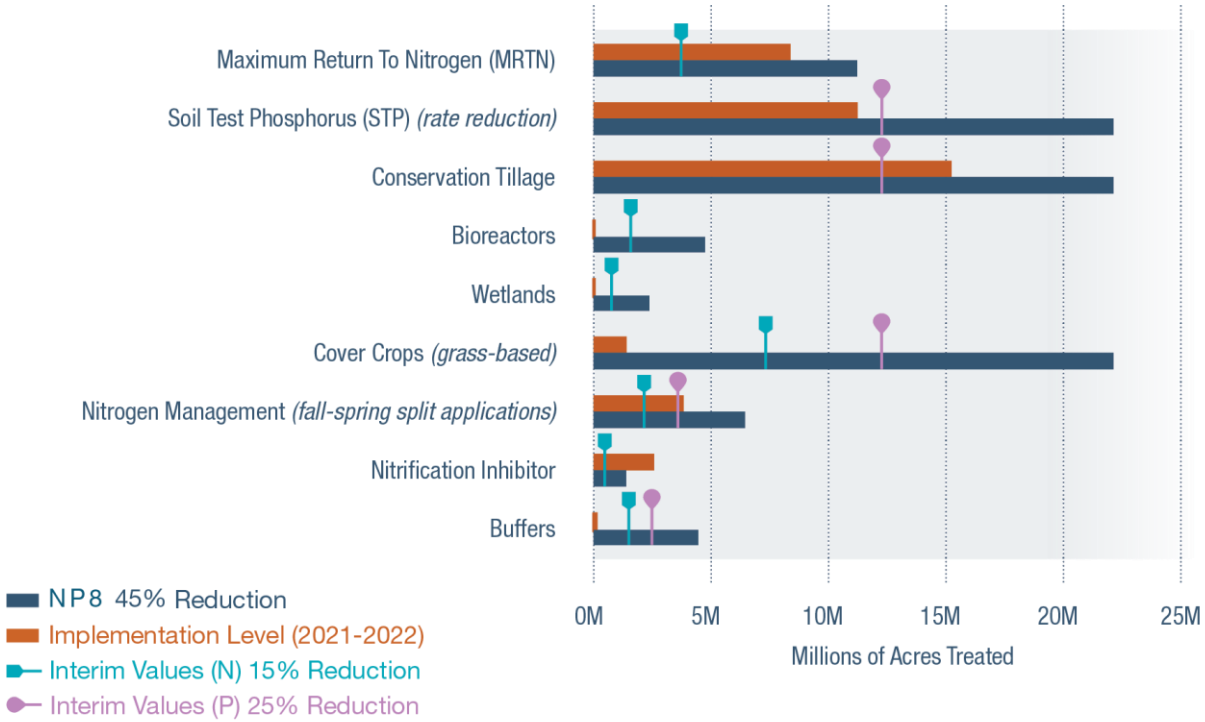

Figure 8.6. *Agricultural implementation as compared with scenario NP8*

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Addition of Conservation Practices

- The Science Team at the University of Illinois developed a process for adding new practices or updating practice performance.
- In 2022, Water and Sediment Control Basin, WASCOB, was approved and added to the list of recommended conservation practices.

Practice	Decision	Efficiency Number	Cost
Water and sediment control basins	Include as an NLRS practice	60% P loss reduction in non-tiled fields; 0% nitrate-N loss reduction	$64/ac/yr

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Statewide Nutrient Export Loading Network

Stream Name	Location	Station Drainage Area in Illinois only, in mi²
Rock River	Joslin	3,973
Green River	Geneseo	1,000
Illinois River	Florence	22,631
Kaskaskia River	New Athens	5,189
Big Muddy River	Murphysboro	2,168
Vermilion River	Danville	1,199
Embarras River	Lawrenceville	2,348
Little Wabash River	Carmi	3,102
Des Plaines River	Joliet	1,502

Basins cover almost 75% of the land area in the state

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

USGS science for a changing world

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“Super Gages”

Parameters (measured every 15 minutes)

- Streamflow
- Nitrate
- Orthophosphate
- Turbidity
- Temperature
- Specific Conductance
- Dissolved Oxygen
- pH

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Statewide Riverine Waterflow and Nutrient Load Changes (2017-21)

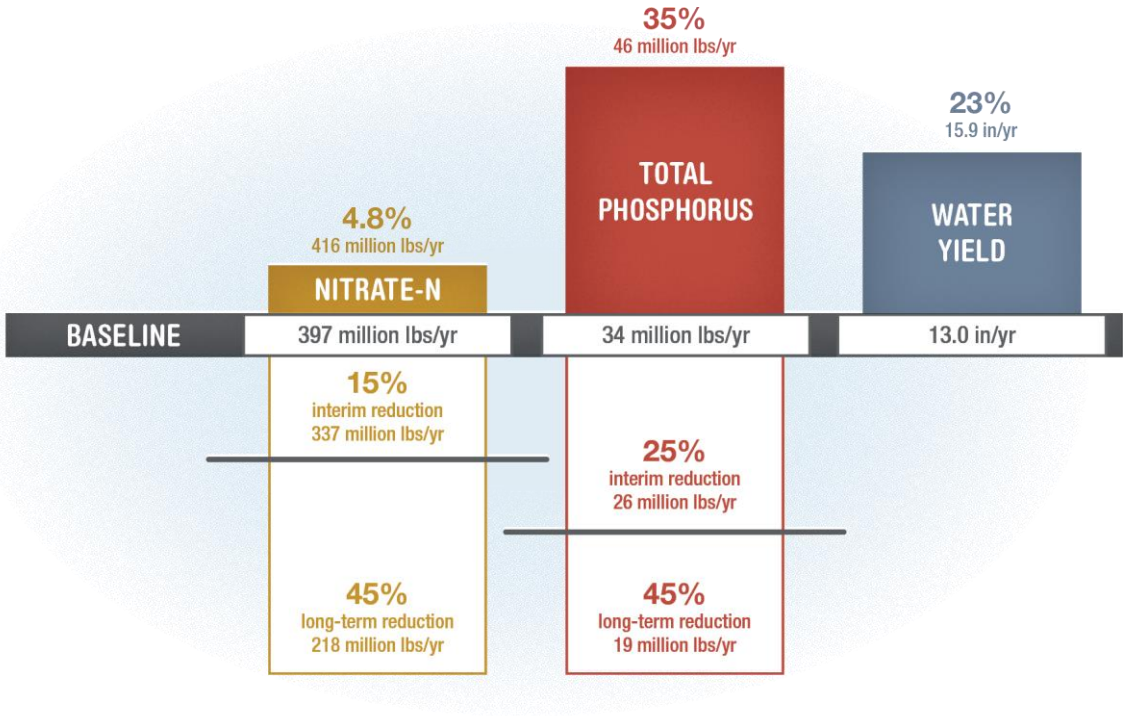

Figure 1.1 *Quantities and percent increases of recent five-year averages (2017–21) of nitrate-nitrogen, total phosphorus, and water yield relative to baseline and to interim and long-term NLRS goals in Illinois.*

- Water Yield increased 23%
- Nitrate-N load increased 4.8%
- Total phosphorus load increased 35%
- Influential factors: climate change, legacy nutrients, and watershed management.

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Specific River Insights

- Illinois River
  - TP load increased 23% , streamflow increased 17%.
  - Over ¾ of the increased could be attributed to the lower mainstem, indicating a shift from sink to source.
- Kaskaskia River
  - TP load increased 102%, streamflow increased 28%.
- Little Wabash River
  - TP load increased 86%, streamflow 30%.
- Rock River (between Rockton and Joslin)
  - Nitrate-N increased 117%, streamflow increased 62%.

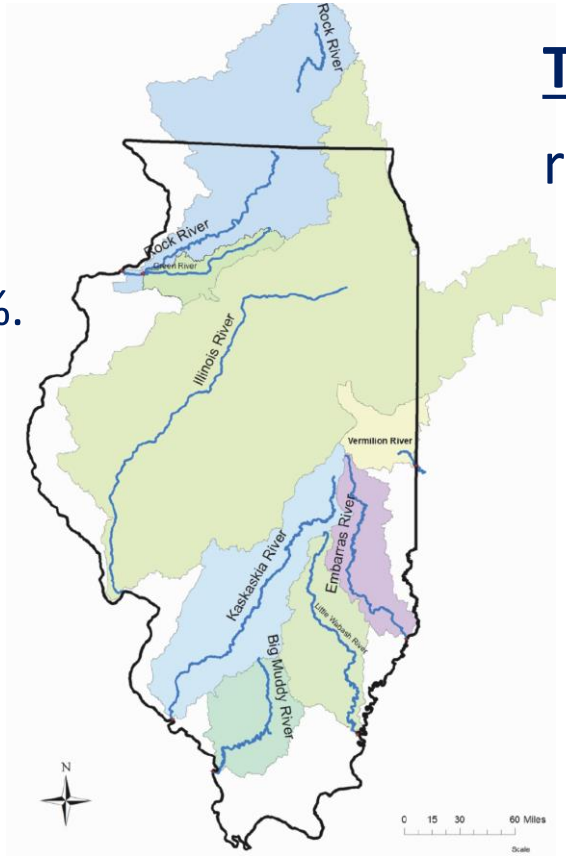
Subwatershed Scale Variability

Nitrate-N loads

ranged -19% to 117%

Total Phosphorus loads

ranged -8% to 102%



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CHAPTER 4
AGRICULTURAL SECTOR

Photo: Dennis Bowman

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Table 4.1. *Funding resources in the agricultural sector*

	2021	2022
Grants or Loans Received	$5,952,381	$11,150,423
Grants or Loans Given	$6,031,760	$7,551,601
Funded Programs	$6,691,548	$13,380,377
Total	**$18,675,690**	**$32,082,402**

Table 4.2. *NLRS outreach events 2021-22*

Type of Outreach	Number of Events	Total Reported Attendance
Presentations	625	70,961
Field Days	186	13,548
Workshops	85	7,939
Conferences	44	18,212
Total	**940**	**110,660**

NLRS NASS Survey 2022

Based on 2021 Cropping Year

- Survey sent to a sample of farmers in Illinois.
- Statistical results extrapolated statewide.
- Survey questions gauge knowledge of nutrient loss issues and level of implementation of recommended agriculture conservation practices.
- Used to estimate implementation of agriculture conservation practices with or without enrollment in state or federal cost share programs.
- This is the fourth time the survey has been conducted.

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Table 4.21. *General knowledge questions (percent reporting)*

		Not at All Knowledgeable	Slightly Knowledgeable	Somewhat Knowledgeable	Knowledgeable	Very Knowledgeable
2022	Nutrient Loss Reduction Strategy	20.3%	24.8%	36.7%	15.7%	2.5%
	MRTN Strategy	30.2%	29.0%	17.6%	14.7%	8.5%
	Woodchip Bioreactors	68.6%	14.7%	11.1%	4.8%	0.8%
	Constructed Wetlands	54.7%	17.2%	14.4%	11.5%	2.2%
	Cover Crop Management	42.1%	20.5%	16.5%	17.9%	3%
	Saturated Buffers	9.1%	24.7%	27.7%	26.1%	12.4%
2020	Nutrient Loss Reduction Strategy	21%	27%	38.4%	11.6%	2%
	MRTN strategy	20.3%	33.5%	25.5%	14.1%	6.6%
	Woodchip Bioreactors	53.8%	23%	15%	5.5%	2.7%
	Constructed Wetlands	19.7%	29.6%	38%	10.2%	2.5%
	Cover Crop Management	9.1%	24.7%	27.7%	26.1%	12.4%

Table 4.14. *Acres with a nitrogen management strategy*

		Acres in 2015	Acres in 2017	Acres in 2019	Acres in 2021
Acres of corn planted	12,600,000	11,700,000	11,200,000	10,500,000	11,000,000
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	3,700,000 or 33% of planted acres	8,360,000 or 76% of planted acres*
Acres where other industry- approved technique was used to determine application rates	Not asked	Not asked	7,750,000 or 69% of planted acres	7,390,000 or 70% of planted acres	Not Asked

*Data for the 2021 crop season are not directly comparable to results from previous surveys as the data collection process was changed significantly

This significant increase in MRTN acres is almost certainly due to the changes NASS made to the survey question wording and to the use of the MRTN location and the year's corn/soy rotation reference map.

Table 4.15. *Fertilizer application strategies for corn acres*

	2017	2019	2021
Corn acres planted	11,200,000	10,500,000	11,000,000
Corn acres fertilized in the fall and winter with dry fertilizer blends	N/A	N/A	4,560,000 or 41.5% of planted acres
Corn acres fertilized in the fall and winter with NH3	N/A	N/A	4,020,000 or 36.5% of planted acres
Corn acres fertilized in the fall and winter with nitrification inhibitors	4,590,000	2,000,000	3,410,000 or 31% of planted acres
Corn acres fertilized in the spring with any fertilizer. This includes split applications and spring only acres	N/A	N/A	8,250,000 or 75% of planted acres
Corn acres fertilized only in the spring with any fertilizer	N/A	N/A	4,440,000 or 40% of planted acres
Corn acres fertilized in the spring with nitrification inhibitors	3,810,000 or 34% of planted acres	4,290,000 or 41% of planted acres	3,690,000 or 33.5% of planted acres

Table 4.16. *Fertilizer application timing for corn acres*

	2021
NASS Corn Planted Acres	11,000,000
Acres fertilized only in the fall	2,740,000
Acres fertilized in the spring and fall (split applications)	3,820,000
Acres fertilized only in the spring	4,440,000

Corn fertilization timing: 25% of acres fall/winter, 35% fall-spring split, 40% in spring

Table 4.17. *Total cropland acres with reduced phosphorus application*

		Acres in 2017	Acres in 2019	Acres in 2021
Tiled Acres	Acres where phosphorus application rates were reduced since 2011	4,440,000	7,410,000	6,210,000
Non-Tiled Acres	Acres where phosphorus application rates were reduced since 2011	2,150,000	3,800,000	
Tiled Acres	Acres where placement of phosphorus applications were moved from broadcast to subsurface or banding	1,530,000	1,440,000	1,080,000
Non-Tiled Acres	Acres where placement of phosphorus applications were moved from broadcast to subsurface or banding	280,000	870,000	

Table 4.18. *Reasons cited for reducing phosphorus applications*

	Acres in 2017	Acres in 2019	Acres in 2021
The Illinois Agronomy Handbook removal rates for phosphorus were updated	2,390,000	4,460,000	1,940,000
Soil test information	4,520,000	9,470,000	4,570,000
Other reasons, including cost	2,420,000	5,030,000	2,010,000

Table 4.19. *Cover crop questions for corn/soybean acres*

	Acres
2021 corn acres planted after cover crops	450,000
2021 soybean acres planted after cover crops	890,000
2021 total cover crops	1,390,000
Corn / Soybean acres planted to cover crops after the 2019 crop season on tiled ground.	930,000
Corn / Soybean acres planted to cover crops after the 2019 crop season on non-tiled ground.	480,000
Corn / Soybean acres planted to cover crops after the 2017 crop season on tiled ground.	290,000
Corn / Soybean acres planted to cover crops after the 2017 crop season on non-tiled ground.	420,000
Corn / Soybean acres planted to cover crops after the 2015 crop season on tiled ground.	490,000
Corn / Soybean acres planted to cover crops after the 2015 crop season on non-tiled ground.	630,000
Corn / Soybean acres planted to cover crops after the 2011 crop season on tiled ground.	220,000
Corn / Soybean acres planted to cover crops after the 2011 crop season on non-tiled ground.	380,000

For comparison, in 2022 farmers reported 520,292 acres of cover crops to FSA.

Table 4.20. *Tiled acres in 2021*

	2021
Corn	7,020,000
Soybeans	6,150,000
Other Crops	390,000
Total Cropland	13,560,000

Agriculture Sector:
State and Federal Cost-Share Programs

USDA FSA	USDA NRCS	Illinois Department of Agriculture	Illinois Environmental Protection Agency	Illinois Department of Natural Resources
Conservation Reserve Program	Conservation Stewardship Program Environmental Quality Incentives program Wetland Reserve Easement Program	Partners for Conservation Cover Crop Premium Discount Program	319 Nonpoint Source Grant Program	Conservation Reserve Enhancement Program

Conservation Reserve Program

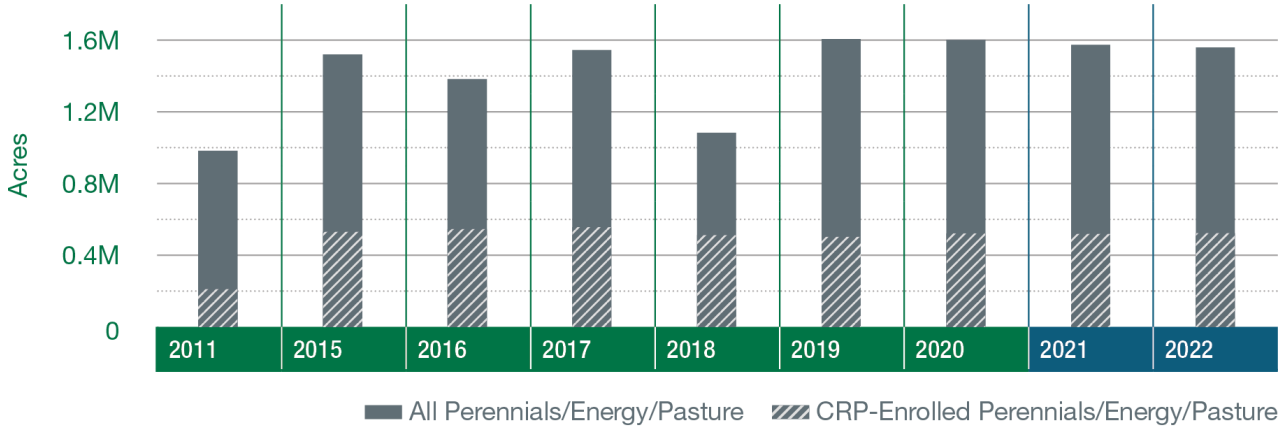

Figure 4.3. *Acres in perennials/energy/pasture. See Appendix G for companion data*

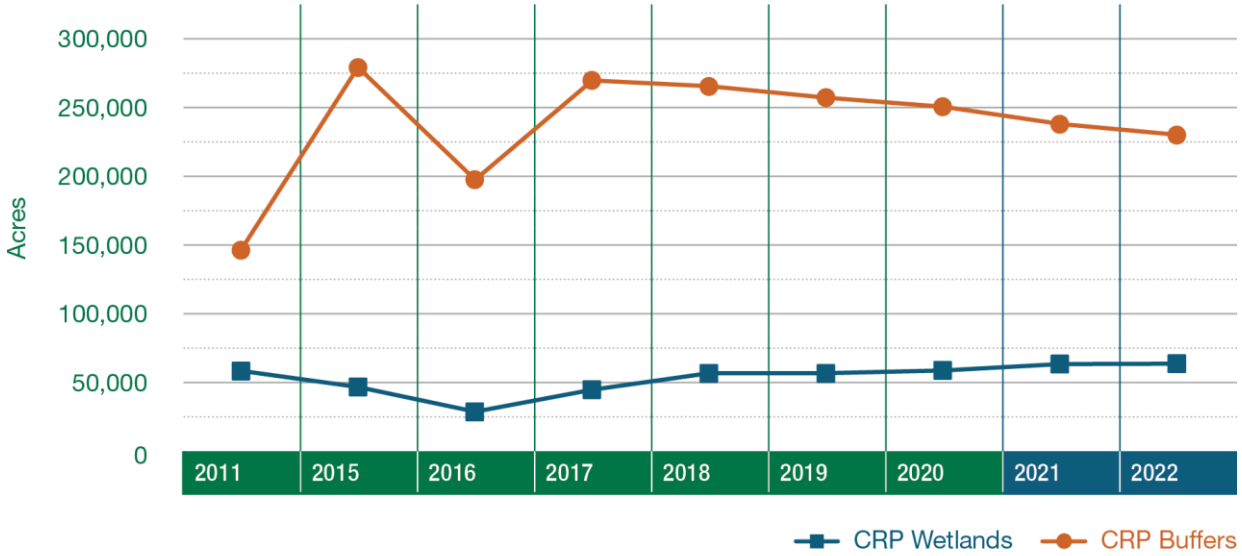

Figure 4.2. *Acres enrolled in CRP wetlands and buffers. See Appendix G for companion data.*

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Cover Crops

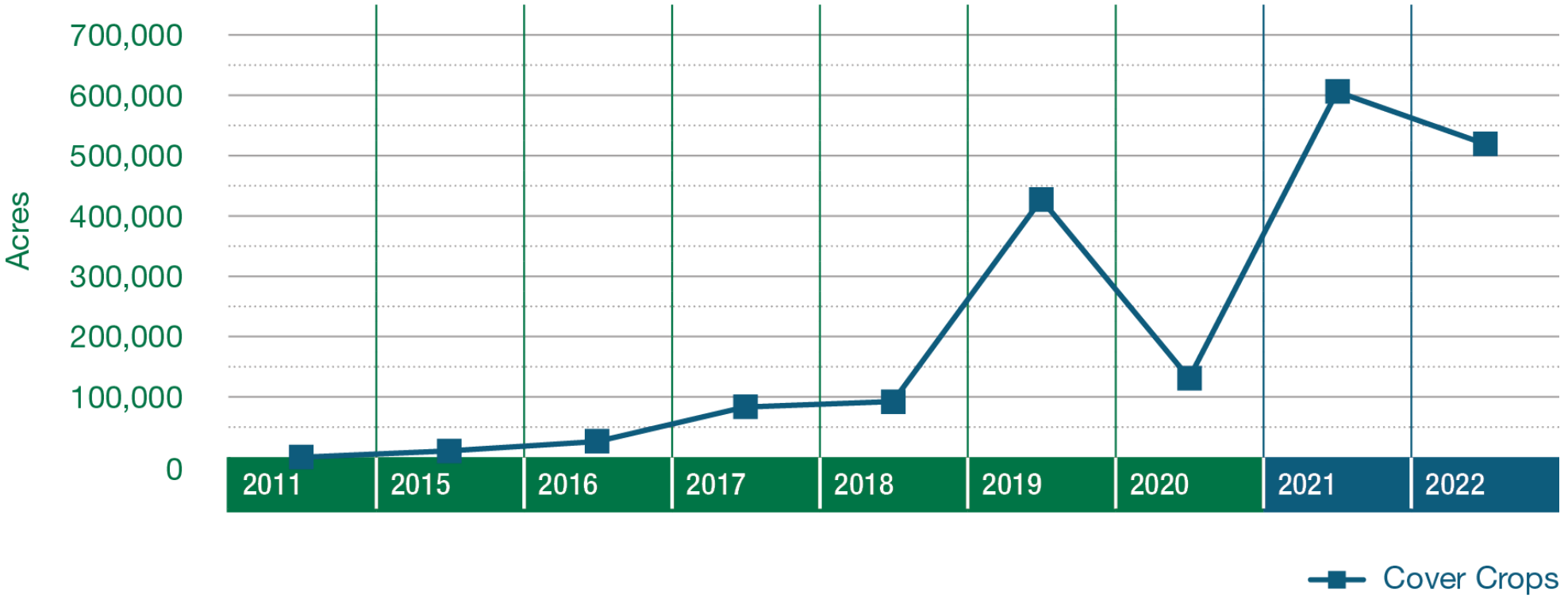


Figure 4.4. *Acres in cover crops reported by producers to FSA. See Appendix G for companion data.*

Environmental Quality Incentives Program

USDA NRCS
U.S. Department of Agriculture
Natural Resources Conservation Service

Conservation Stewardship Program

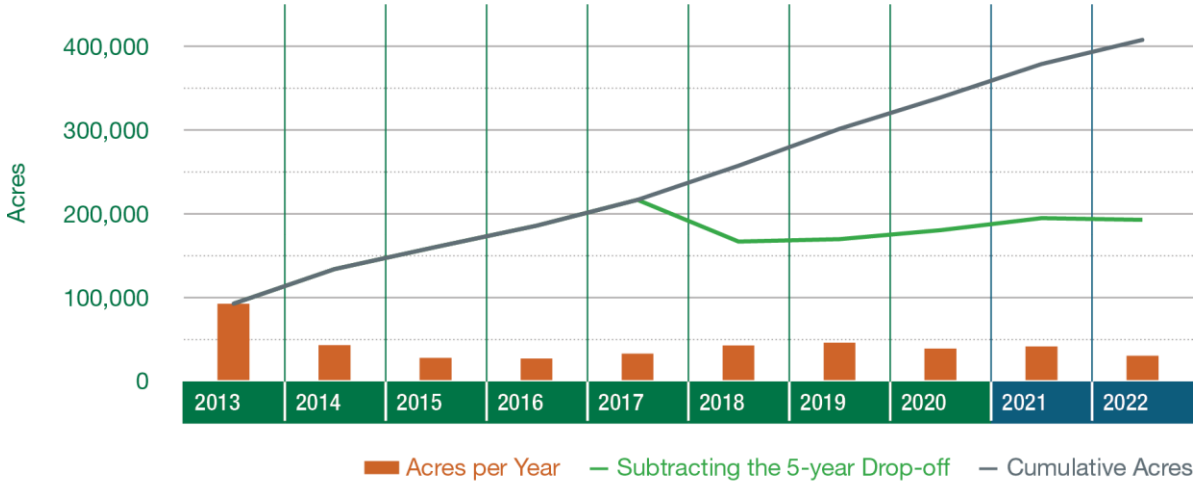


Figure 4.5. *Total acres enrolled in EQIP. See Appendix G for companion data.*

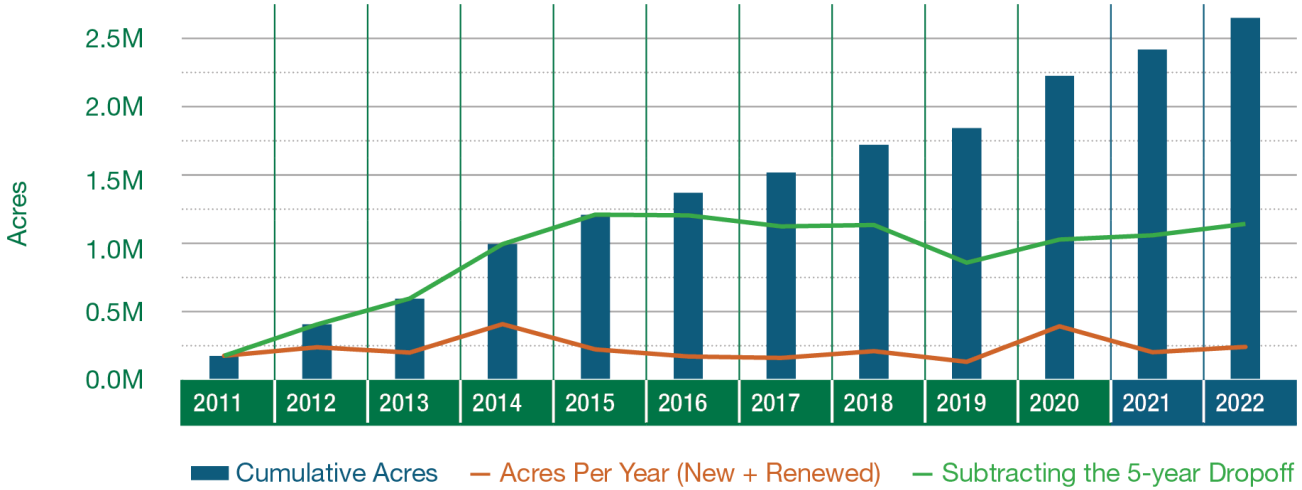


Figure 4.7. *Cumulative acres enrolled in CSP, 2011–22. See Appendix G for companion data*

Environmental Quality Incentives Program

USDA NRCS
U.S. Department of Agriculture
Natural Resources Conservation Service

Conservation Stewardship Program

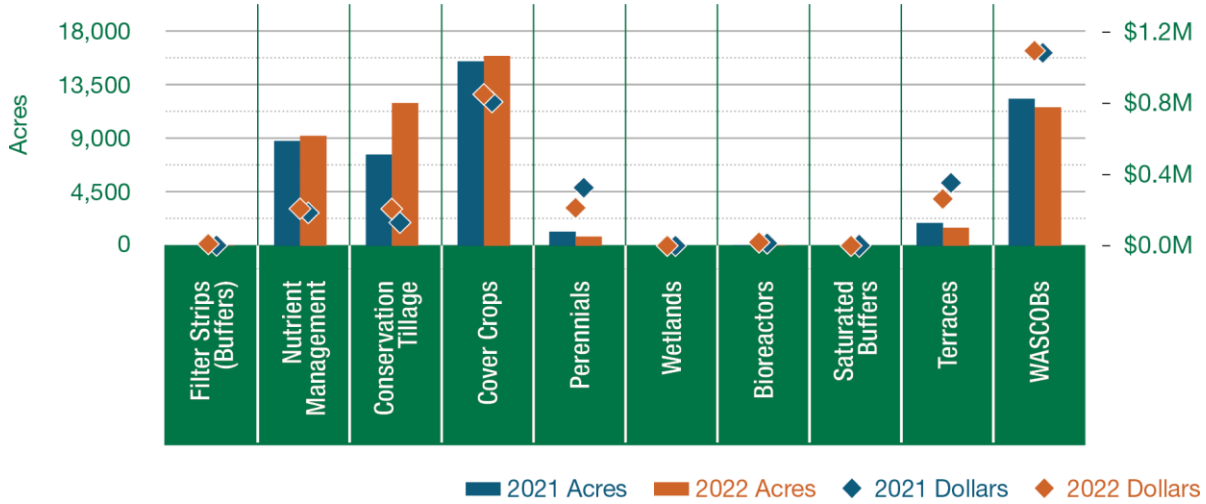


Figure 4.6. *Acres implemented and dollars spent on nutrient conservation practices through EQIP. See Appendix G for companion data.*

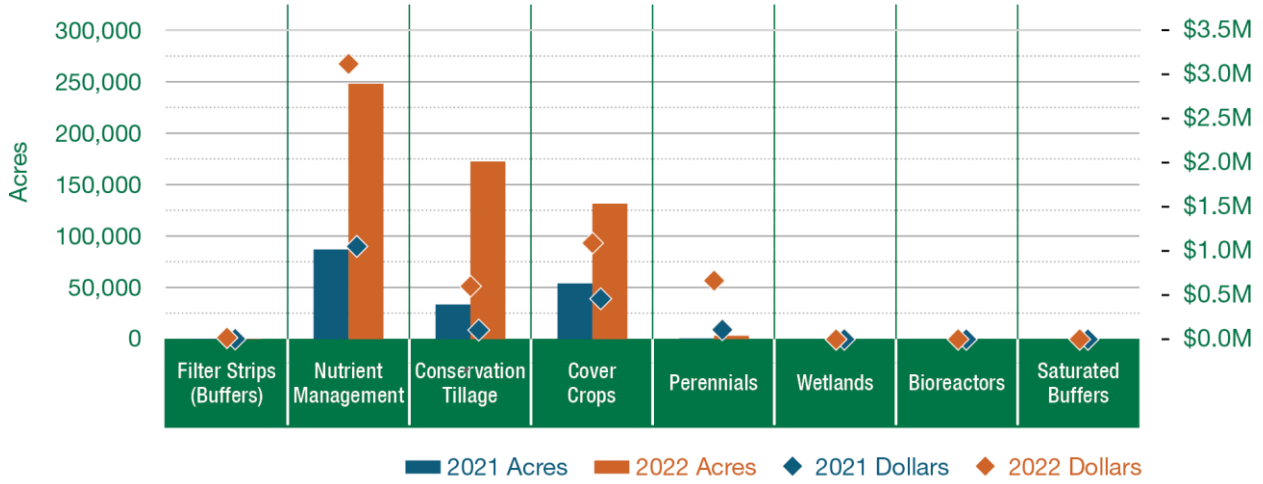


Figure 4.8. *Acres implemented and dollars spent on nutrient conservation practices through CSP. See Appendix G for companion data*

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

USDA NRCS
U.S. Department of Agriculture
Natural Resources Conservation Service

Wetland Reserve Easement Program

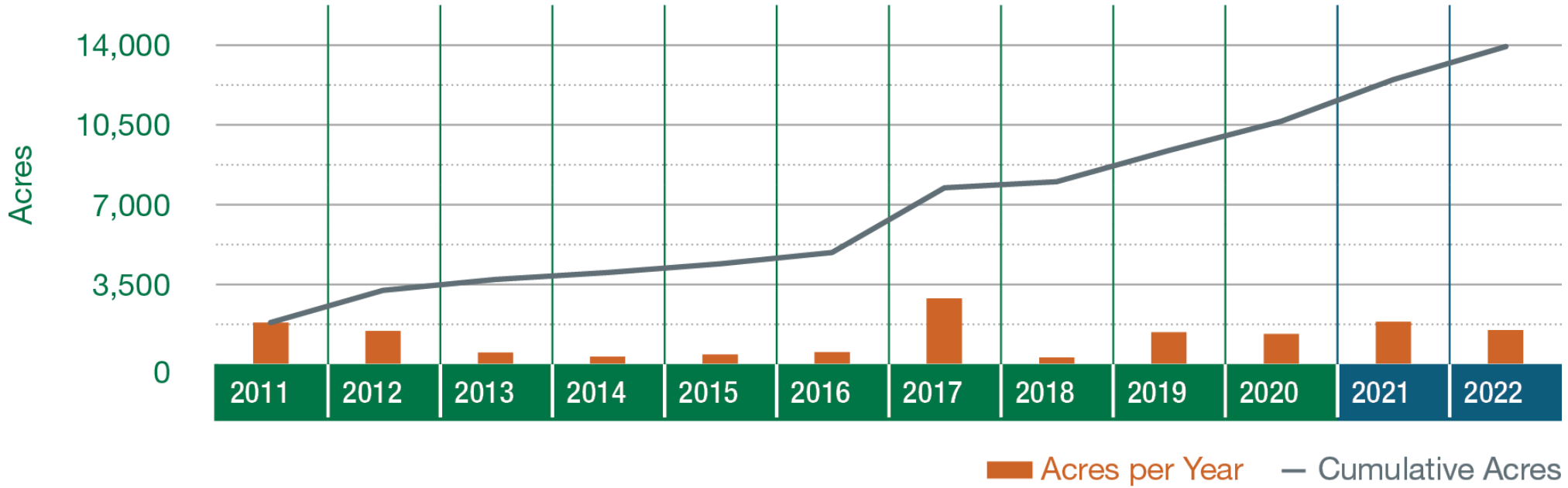


Figure 4.9. *New wetland acres enrolled in ACEP-WRE and ACEP-WRE/WREP programs. See Appendix G for companion data.*

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

Conservation Reserve Enhancement Program

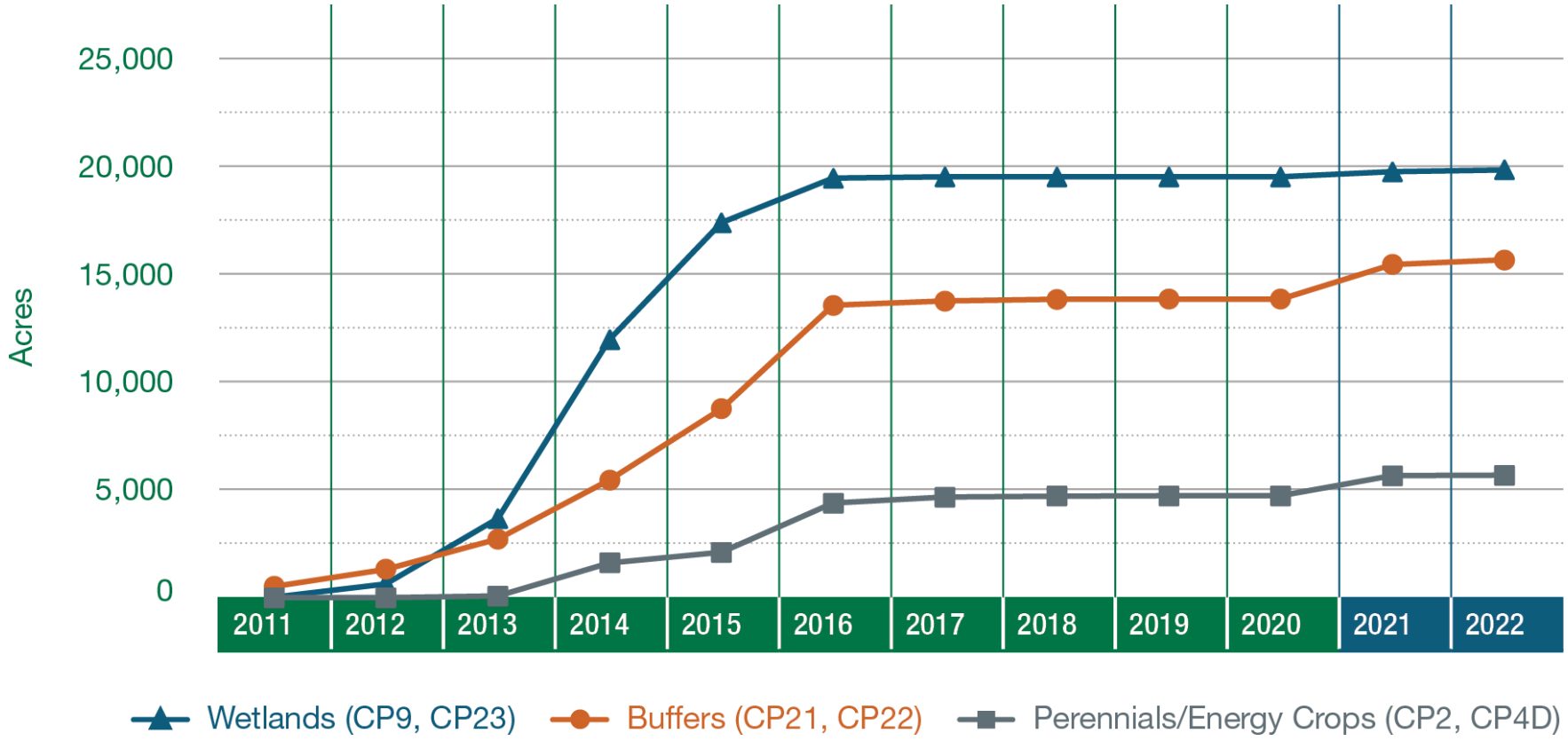


Figure 4.21. *Acres of Illinois CREP easements contributing to NLRS. See Appendix G for companion data.*

Note: CREP enrollment was suspended 2015-2022.

Illinois Department of Agriculture

Partners for Conservation

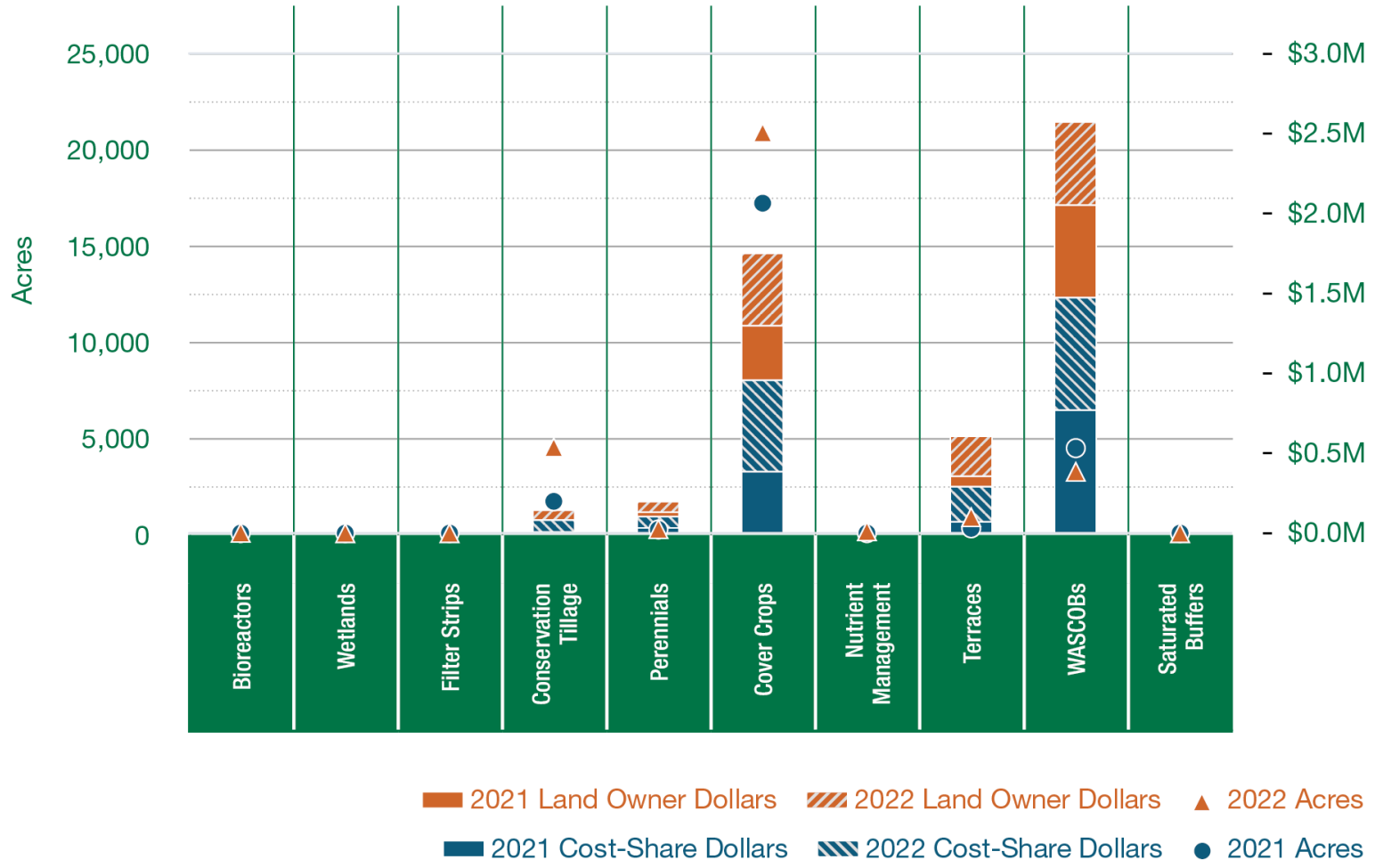


Figure 4.22. *Acres treated by and dollars spent on PFC in 2021 and 2022*

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

Cover Crop Premium Discount Program

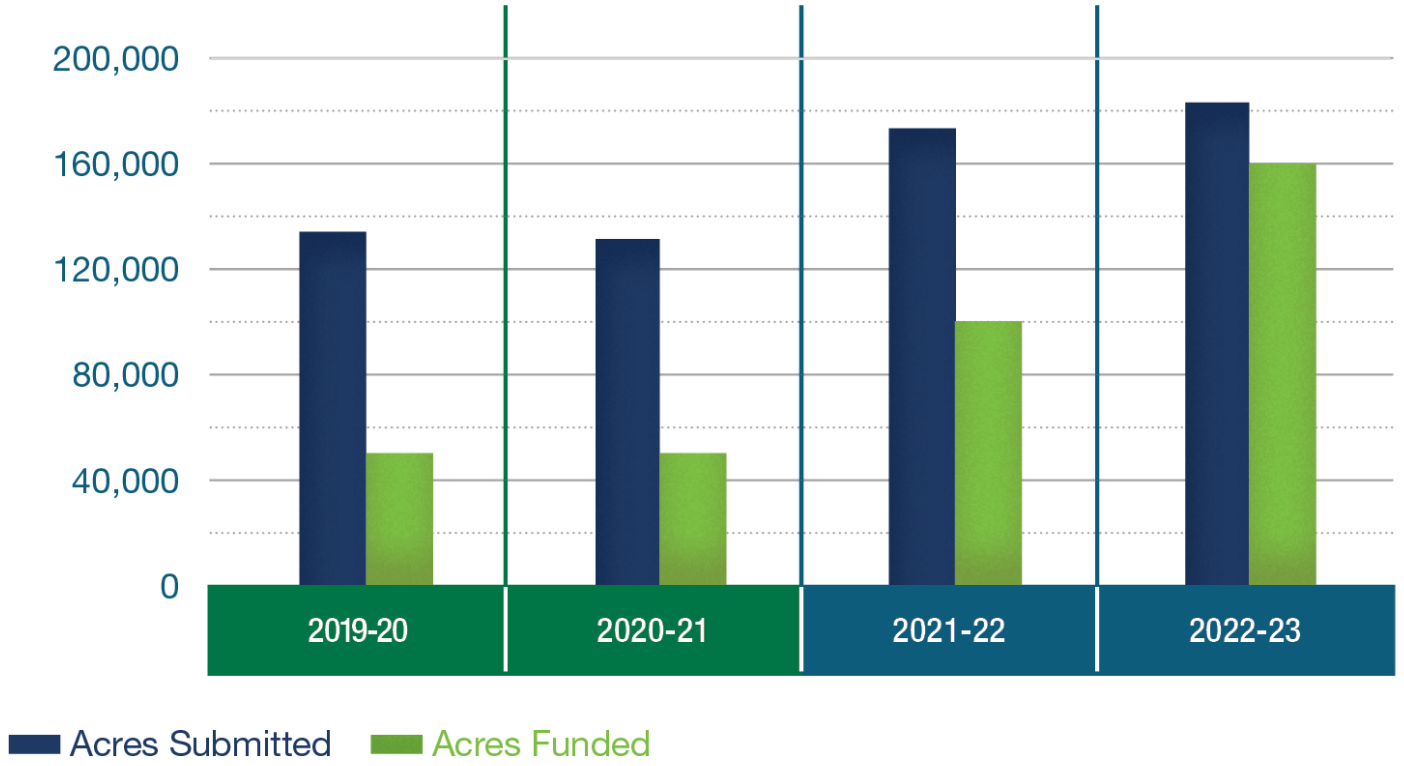
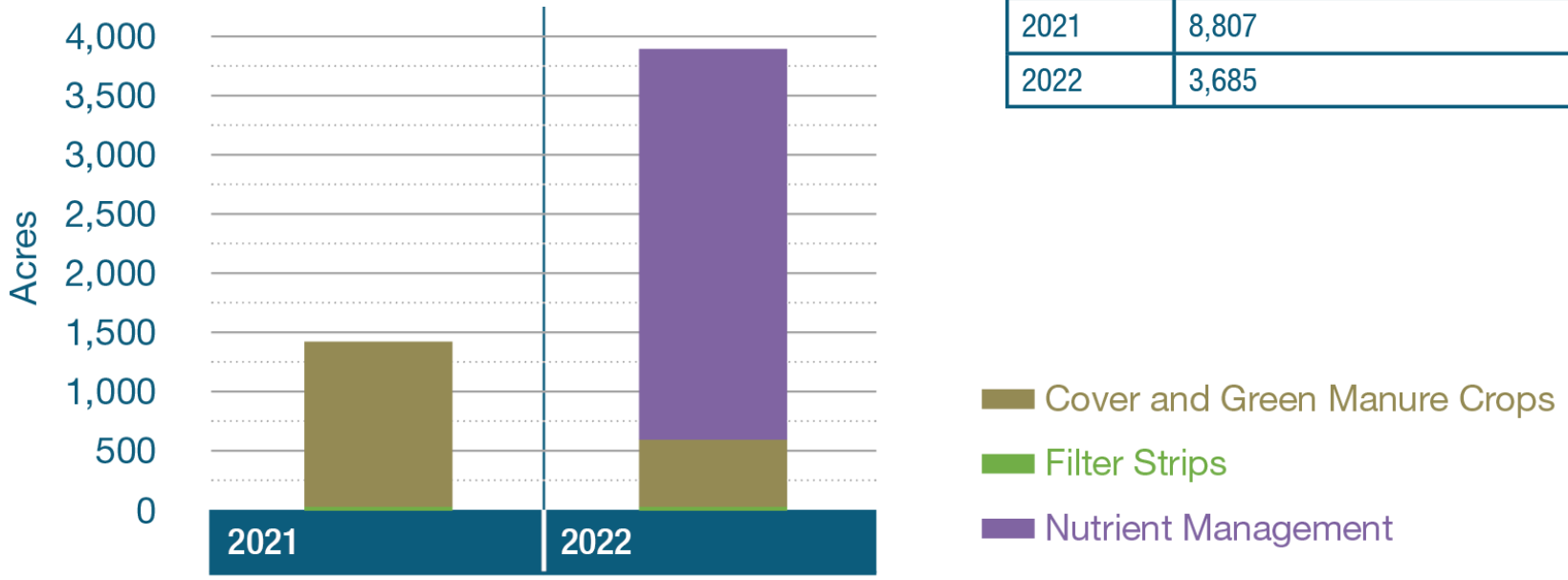


Figure 8.10 *Acres submitted to and funded by the Fall Covers for Spring Savings program since 2019*

319 Nonpoint Source Grant Program

Companion data to Figure 4.25. *Acres treated by agricultural practices installed under the Section 319 grant program 2021-22*

	Cover and Green Manure Crops	Filter Strips	Nutrient Management
2021	1,434	3	-
2022	591	-	3,294



Companion data to Figure 4.26. *Calculated total nitrogen and total phosphorus load reductions (lb/yr) from Section 319 grant program agricultural practices 2021–22*

	N reduction (lbs/yr)	P reduction (lbs/yr)
2021	8,807	972
2022	3,685	460

Figure 4.25. *Acres treated by agricultural practices installed under the Section 319 grant program 2021-22. See Appendix G for companion data.*

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

University of Illinois

- 9 new bioreactors added in 2021-22
- Subtracted bioreactors >10 years old
- By the end of 2022, **37** known Woodchip Bioreactors treating **1,499 acres**

Photo: Janith Chandrasoma

Partner Updates

ILLINOIS NREC

Metropolitan Water Reclamation District of Greater Chicago

PCM Precision Conservation Management

pork Illinois Pork Producers Generations of Commitment

Saving Tomorrow's Agriculture Resources S.T.A.R.™

Illinois Sustainable Ag Partnership

r4 nutrient stewardship KEEP IT 4R CROP Illinois Fertilizer & Chemical Association IFCA

4R4U

Illinois Corn Growers Association

Trees Forever Planting a better tomorrow™

Illinois Farm Bureau Farm. Family. Food.™

American Farmland Trust

The Nature Conservancy

Illinois Nutrient Loss Reduction Strategy

39 NGO Agricultural Partner Programs & Projects Supporting NLRS

- 4R Field Day
- 4R Metrics Survey
- 5-Year Soil Health Transition
- Carbon and Ecosystem Market Resources and Programs
- Edge-of-Field Partnership for Saturated Buffers
- Edge-of-Field Partnership for Woodchip Bioreactors
- Farm Gate
- Illinois Ag Retailer Survey
- Illinois Farm Bureau NLRS Priority Watershed Work
- IFCA-supported NREC Projects
- Illinois Buffer Partnership
- Illinois Cover Crop Initiative
- Illinois Cover Crop Programs
- Illinois Grazing Lands Coalition
- Illinois Sustainable Ag Partnership
- ILSoyAdvisor
- Keep it 4R Crop
- Mackinaw River Program
- Nitrogen Rate Trials
- Nutrient Research & Education Council
- Nutrient Stewardship Grant Program
- Post Application Coverage Endorsement
- Partnerships with Drinking Water Suppliers and Wastewater Treatment Plants
- Perennial Bioenergy Crop Diversification Project
- Precision Conservation Management
- Soil and Water Outcomes Fund
- STAR Conservation Evaluation Tool
- Sustaining Our Future: A Farm Family Story
- Tree Buffer Program
- Upper Macoupin Creek Watershed Partnership
- Vermilion Headwaters Watershed Partnership
- Water Supply & Industry Partnerships
- Water Testing Initiative

ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY

CHAPTER 5
POINT SOURCE SECTOR

Photo: Fox Metro Water Reclamation District

ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY

Point Source Updates

- 2021 and 2022 Nitrogen and Phosphorus loads
  - Municipal sewage treatment plants and Industrial facilities
  - Reductions compared to 2011 baseline loads
- Facilities with annual average concentrations
  - 1.0 mg/l
  - 0.5 mg/l
- Nutrient Assessment and Reduction Plans
- Optimization and Feasibility Plans for reducing phosphorus loads
- Watershed Planning group updates

ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY

Table 5.1. *Reported expenditures supporting 2021-22 nutrient reduction activities in the point source sector for Illinois Association of Wastewater Agencies reporting agencies, watershed groups, and Illinois EPA*

Nutrient Reduction-Related Activity	2021 Totals	2022 Totals
Capital improvement	$19,970,913	$5,954,693
Operations and maintenance	$4,761,296	$4,592,671
Feasibility studies or permit-required projects	$700,830	$20,668
Staff	$4,762,150	$4,740,326
Other resources	$225,278	$169,321
Illinois EPA State Revolving Fund's Water Pollution Control Loan Program	$107,296,729	$84,520,637
Total	**$137,717,196**	**$99,998,316**

Table 5.2. *Point source sector activities and attendance 2021-22*

Type of Activity	Number of Events	Attendance
Field Days	2	100
Presentations	12	4,000
Workshops	2	175
Conferences	2	45
Totals	**18**	**4,320**

Point Source Updates

Table 5.3. *Statewide total phosphorus loads from the point source sector from 2021-22*

Point Source Sector	2021 Total Phosphorus Load (million lb/yr)	2022 Total Phosphorus Load (million lb/yr)
Annual Point Source Load • 211 Major Municipals • Minor Municipals • All Industrials	12.5 10.7 1.3 0.5	11.9 10.2 1.3 0.4
Reductions from 2011 Baseline load of 18.1 million lb/yr	5.6 (31%)	6.2 (34%)

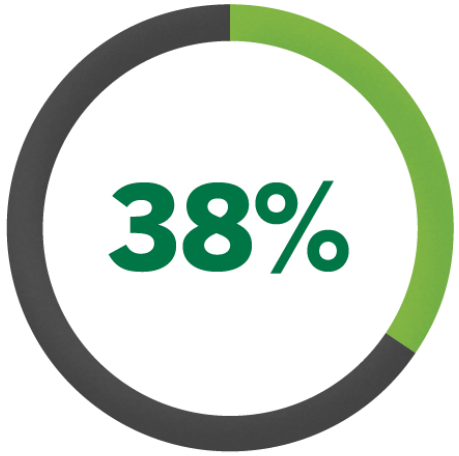


Figure 5.4.

Percentage of major municipal NPDES permits with total phosphorus limits statewide

2022: 34% Total Phosphorus Reduction

Point Source Updates

Table 5.9. *Statewide total nitrogen loads from the point source sector from 2021-22*

Point Source Sector	2021 Total Nitrogen Load (million lb/yr)	2022 Total Nitrogen Load (million lb/yr)
Annual Total Nitrogen Load • 211 Major Municipals • Minor Municipals • Major and Minor Industrials	76.6 71.4 3.0 2.2	77.2 72.2 3.0 2.0
Reductions from 2011 Baseline of 87.3 million pounds per year	10.7 (12.2%)	10.1 (11.6%)

2022: 11.6% Total Nitrogen Reduction

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

Top 10 Wastewater Treatment Facilities for Total Phosphorus Discharge

Table 5.4. *Top 10 major municipal facilities contributing total phosphorus loads in 2022*

NPDES Permit	Facility Name	Total Phosphorus Load (lb/yr)						Percent Change
		2011	2018	2019	2020	2021	2022	2011-22
IL0028061	Calumet Water Reclamation Plant (MWRDGC)	2,450,714	1,990,902	2,191,160	2,569,259	2,553,033	2,756,427	12%
IL0028321	Sanitary District of Decatur – Main Sewage Treatment Plant	1,562,750	2,022,573	2,011,785	1,897,809	1,601,329	1,745,380	12%
IL0028053	Stickney Water Reclamation Facility (MWRDGC)	2,351,312	707,230	2,164,828	2,435,218	1,277,750	995,924	-58%
IL0028088	Terrence J. O'Brien WRP (MWRDGC)	971,083	931,333	947,758	978,314	1,036,758	873,938	-10%
IL0027201	Four Rivers Sanitation Authority Sewage Treatment Plant	216,837	280,052	231,141	223,527	235,553	229,546	6%
IL0036340	John E. Egan WRP (MWRDGC)	233,759	209,074	219,942	210,437	221,709	194,107	-17%
IL0027723	Thorn Creek Basin Sanitary District Sewage Treatment Plant	104,111	130,969	99,404	96,844	123,564	176,694	70%
IL0034061	Springbrook Water Reclamation Center – Naperville	190,457	166,060	155,307	162,805	181,804	149,175	-22%
IL0027731	Bloomington-Normal Water Reclamation District west-side plant	139,207	101,236	132,693	124,924	127,637	101,959	-27%
IL0028380	Downers Grove Sanitary District Wastewater Treatment Center	91,396	85,647	103,297	110,224	113,246	86,741	-5%

Table 5.5. *Top 10 major municipal facilities' flow and total phosphorus concentrations in 2021-22*

NPDES Permit	Facility Name	2021 Average Flow (MGD)	2021 Average TP Concentration (Mg/L)	2022 Average Flow (MGD)	2022 Average TP Concentration (Mg/L)
IL0028061	Calumet Water Reclamation Plant (MWRDGC)	233	3.67	236	4.19
IL0028321	Sanitary District of Decatur – Main Sewage Treatment Plant	35	15.08	36	16.39
IL0028053	Stickney Water Reclamation Facility (MWRDGC)	604	0.72	665	0.52
IL0028088	Terrence J. O'Brien WRP (MWRDGC)	204	1.68	209	1.43
IL0027201	Four Rivers Sanitation Authority Sewage Treatment Plant	27	2.77	28	2.67
IL0036340	John E. Egan WRP (MWRDGC)	22	3.36	22	2.95
IL0027723	Thorn Creek Basin Sanitary District Sewage Treatment Plant	12	3.35	13	4.41
IL0034061	Springbrook Water Reclamation Center – Naperville	17	3.48	18	2.77
IL0027731	Bloomington-Normal Water Reclamation District west-side plant	18	2.33	16	2.23
IL0028380	Downers Grove Sanitary District Wastewater Treatment Center	10	4.01	10	3.13

Nutrient Assessment and Reduction Plan (NARP)

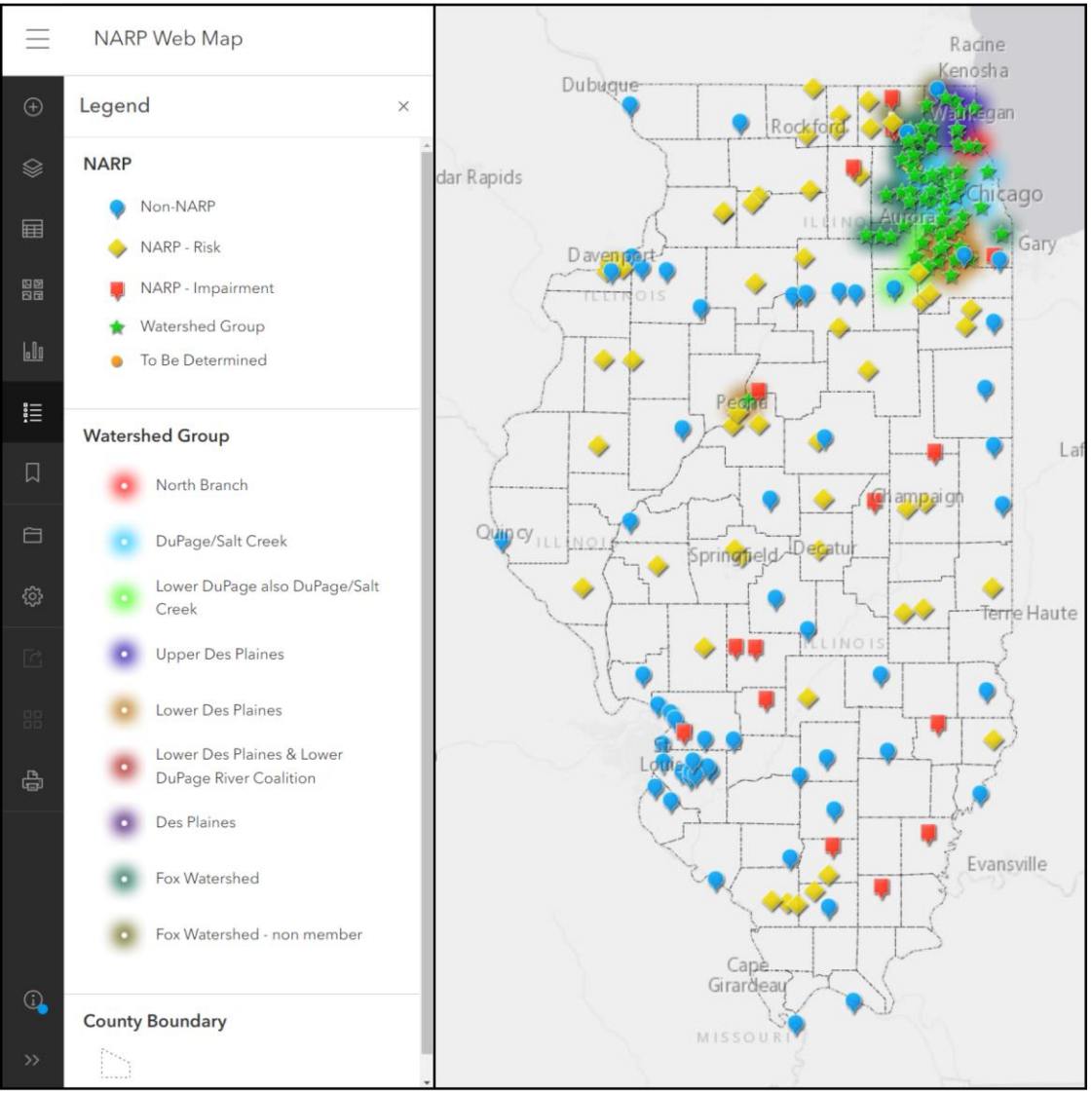
- IAWA and NGO Agreement for Major (>1 MGD) Facilities
- Special Condition in NPDES permits
- Required if facility is:
  - located upstream of a waterbody or stream segment that has been determined to have a phosphorus related impairment, or
  - determined to be at risk of eutrophication due to phosphorus levels in the waterbody.
  - Effluent limit of 0.5 mg/L Total Phosphorus 12 month rolling geometric mean by January 1, 2030 unless not technologically feasible or economically reasonable or meets one of the special circumstances
- Not an Effluent or Water Quality Standard

Nutrient Assessment and Reduction Plan (NARP)

- Developed and submitted to Illinois EPA by December 31, 2023 or 2024
- Supported by data and sound scientific rationale
- Must cooperate and work with other stakeholders in the watershed
- Target Levels –
  - Recommendations by the Nutrient Science Advisory Committee – Dec 2018
  - Develop its own watershed-specific target levels
- Identify phosphorus input reductions from point sources and non-point sources
- Schedule for implementation
- Provisions for water quality trading

ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY

67 facilities are developing Nutrient Assessment Reduction Plans. Another 89 are developing NARPs as part of a watershed group.



Watershed Groups

- Des Plaines River Watershed Workgroup
- DuPage River Salt Creek Workgroup
- Fox River Study Group
- Lower Des Plaines Watershed Group
- Lower DuPage River Watershed Coalition
- North Branch Chicago River Watershed Workgroup
- the newly formed Illinois River Watershed Study Group

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

CHAPTER 6
STORMWATER SECTOR

Photo: Red Oak Rain Garden

ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY

Urban Stormwater Updates

Table 6.1. *Resources reported by stormwater sector partners*

	2021	2022
Grants or Loans Received	$279,500	$655,001
Grants or Loans Given	$1,140,043	$1,467,191
Funded Programs	$641,256	$39,334
Total	$2,060,799	$2,161,526

In addition, the Metropolitan Water Reclamation District of Greater Chicago, MWRDGC, invested $1.45 million in Green Infrastructure Program projects in 2021, adding over half a million gallons of retention capacity. MWRDGC committed $44.7 million for the 2021 stormwater program.

Urban Stormwater Updates

Table 6.2. *Types of outreach activities by the stormwater sector as reported by NLRS partners*

Type of Activity	Number of Events	Attendance
Field Days	18	2,830
Presentations	57	1,231
Conferences	10	1,800
Education and Training Workshops	36	3,106
Totals	121	8,967

Table 6.3. *Scope of stormwater sector outreach based on MS4 community reports from 2022*

Type of Activity	Number of MS4 reports	Percent of total MS4 reports
Education and Training Workshops	297	95%
Presentations	278	89%
Conferences	86	27%
Field Days	38	12%
Technical Assistance	159	51%

Urban Stormwater Updates

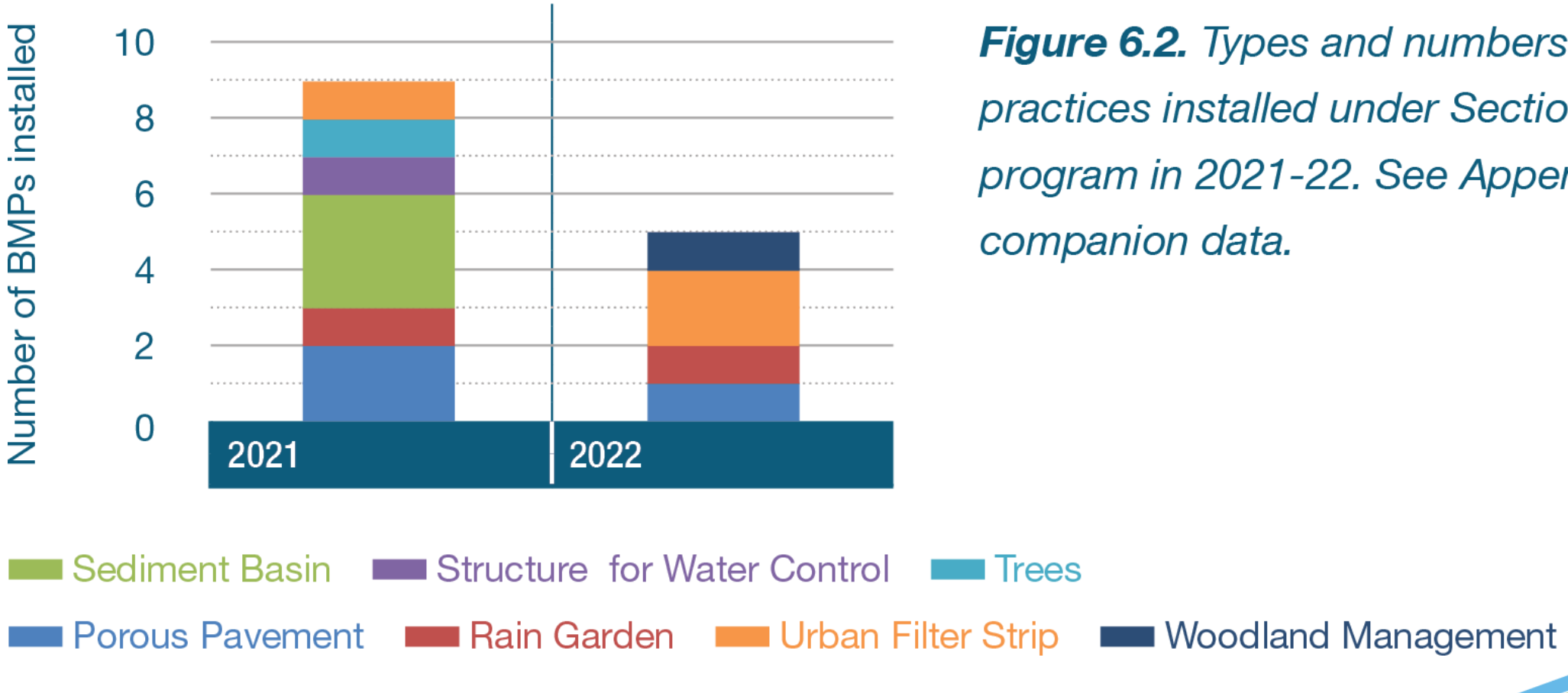


Figure 6.2. *Types and numbers of urban practices installed under Section 319 grant program in 2021-22. See Appendix G for companion data.*

Urban Stormwater Updates

- Summary of Municipal Separate Storm Sewer Systems (MS4) Annual Inspection Reports
- Illinois EPA 319 and Green Infrastructure Grant programs
- Metropolitan Water Reclamation District of Great Chicago's Green Infrastructure Program
- Partner updates on stormwater programs
  - Calumet Stormwater Collaborative
  - CMAP
  - Conservation@Home
  - DuPage County programs
  - IDOT
  - Illinois Groundwork
  - Parkland College NGIC Program
  - Lawn to Lake Midwest
  - MWRD GI Program
  - Rainscaping
  - Red Oak Rain Garden
  - Watershed-Based planning
    - CMAP
    - DuPage County
    - Greater Egypt RPDC

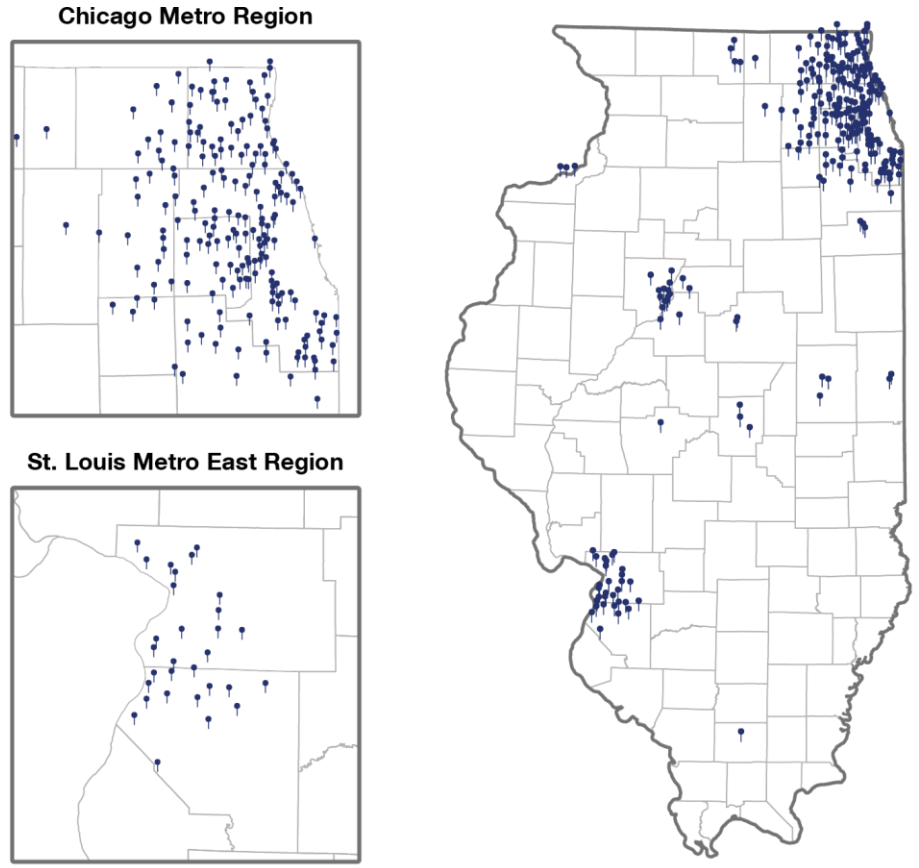


Figure 6.5. Illinois MS4 communities evaluated in 2021 and 2022

CHAPTER 8

ADAPTIVE MANAGEMENT AND MEASURING PROGRESS

Photo: Layne Knoche

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

Nutrient Loads and Water Quality Goals

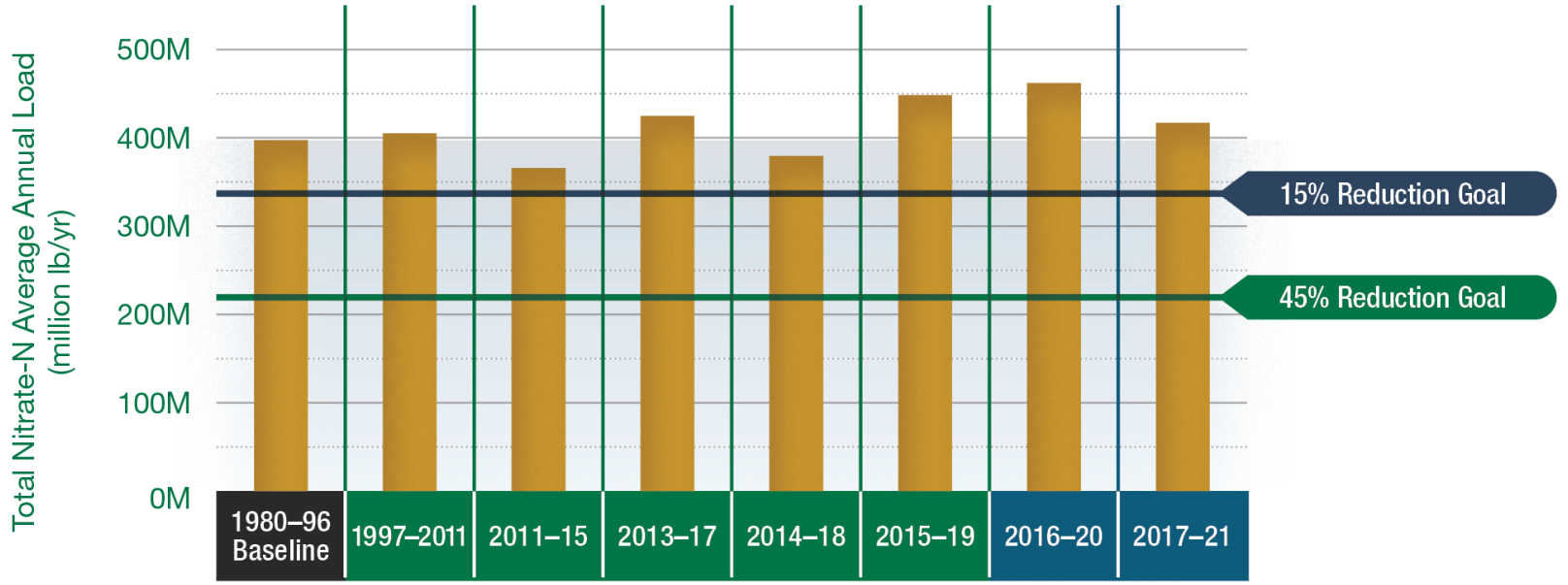


Figure 8.1. *Illinois nitrate-nitrogen loads relative to the 2025 interim and long-term reduction goals*

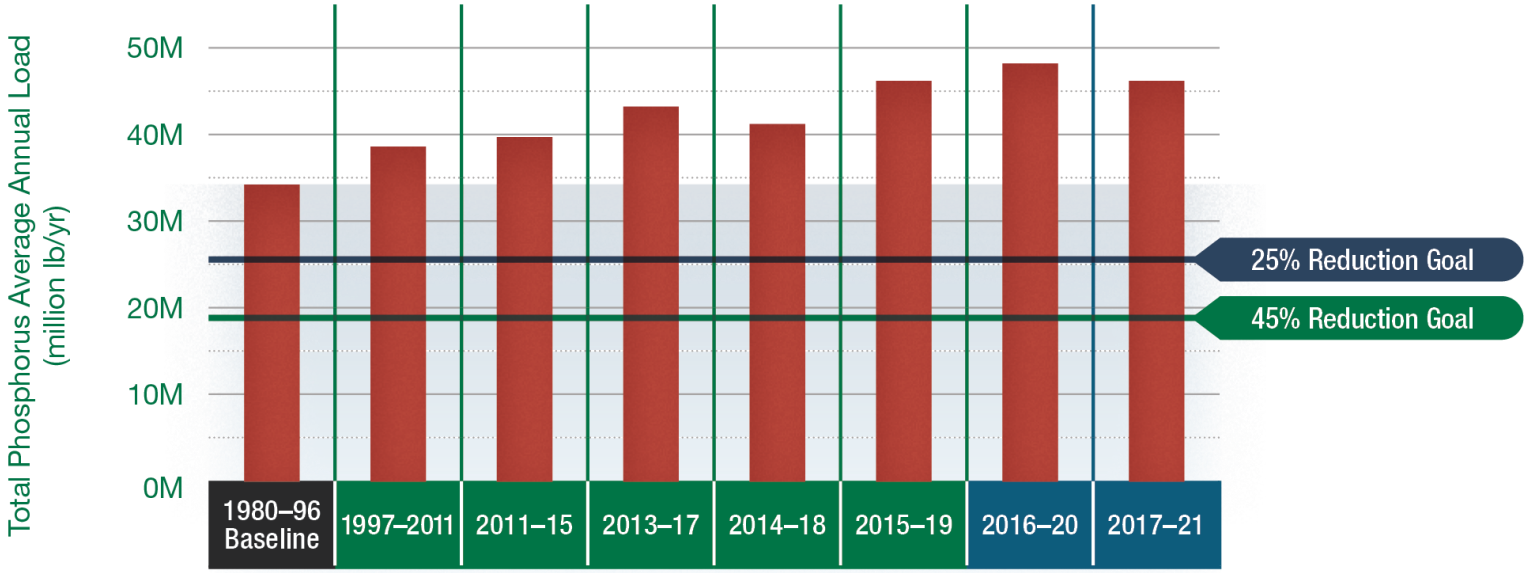


Figure 8.2. *Illinois total phosphorus loads relative to the 2025 interim and long-term reduction goals*

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

Agriculture Implementation Scenarios

Scenario NP2

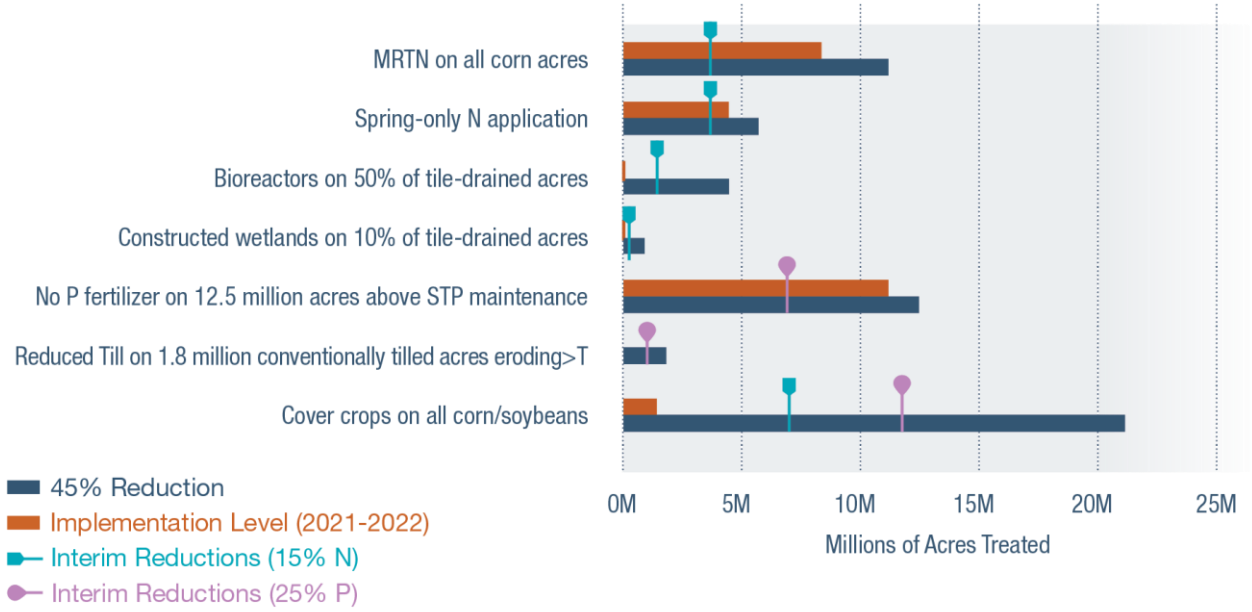


Figure 8.3. *Agricultural implementation as compared with scenario NP2*

Scenario NP3

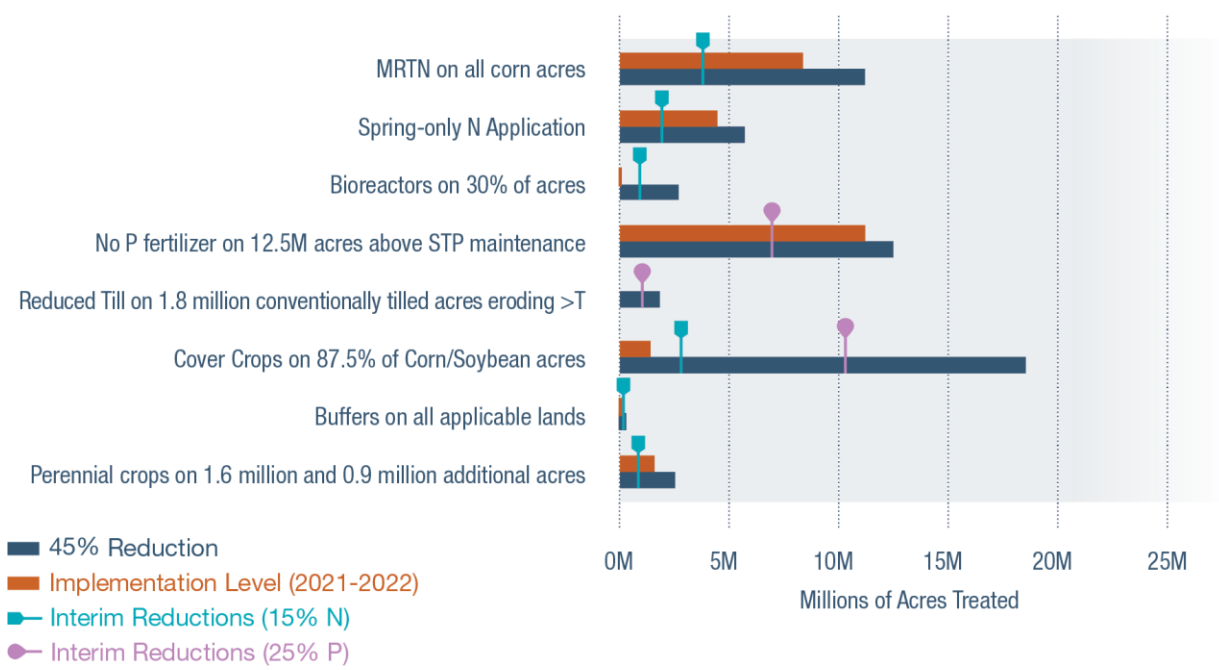


Figure 8.4. *Agricultural implementation as compared with scenario NP3*

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

Agriculture Implementation Scenarios

Scenario NP7

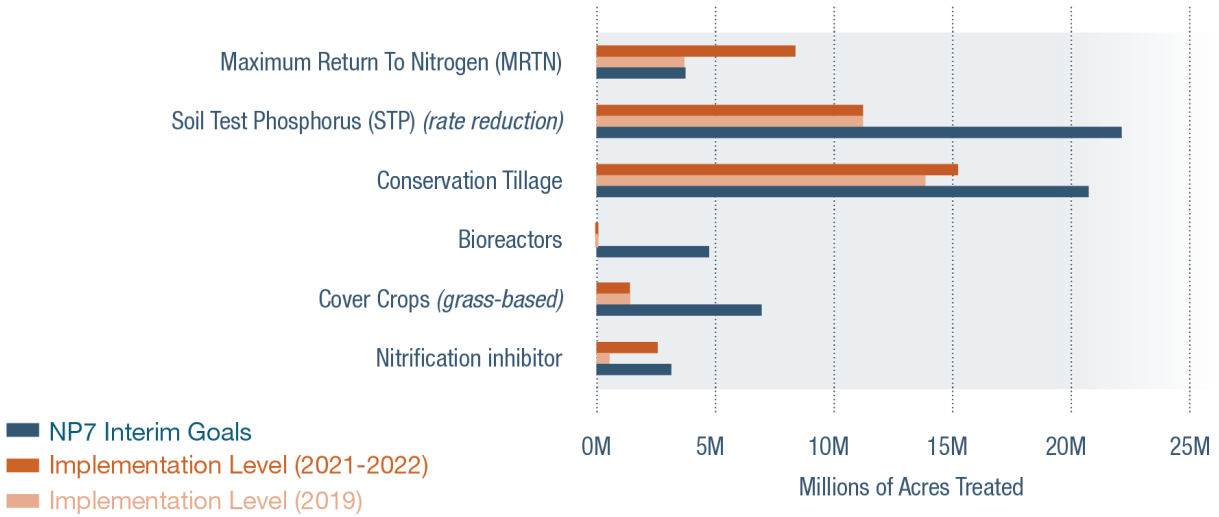


Figure 8.5. *Agricultural implementation as compared with scenario NP7. Scenario NP7 represents the level of practice adoption needed to meet 2025 interim reduction goals.*

Scenario NP8

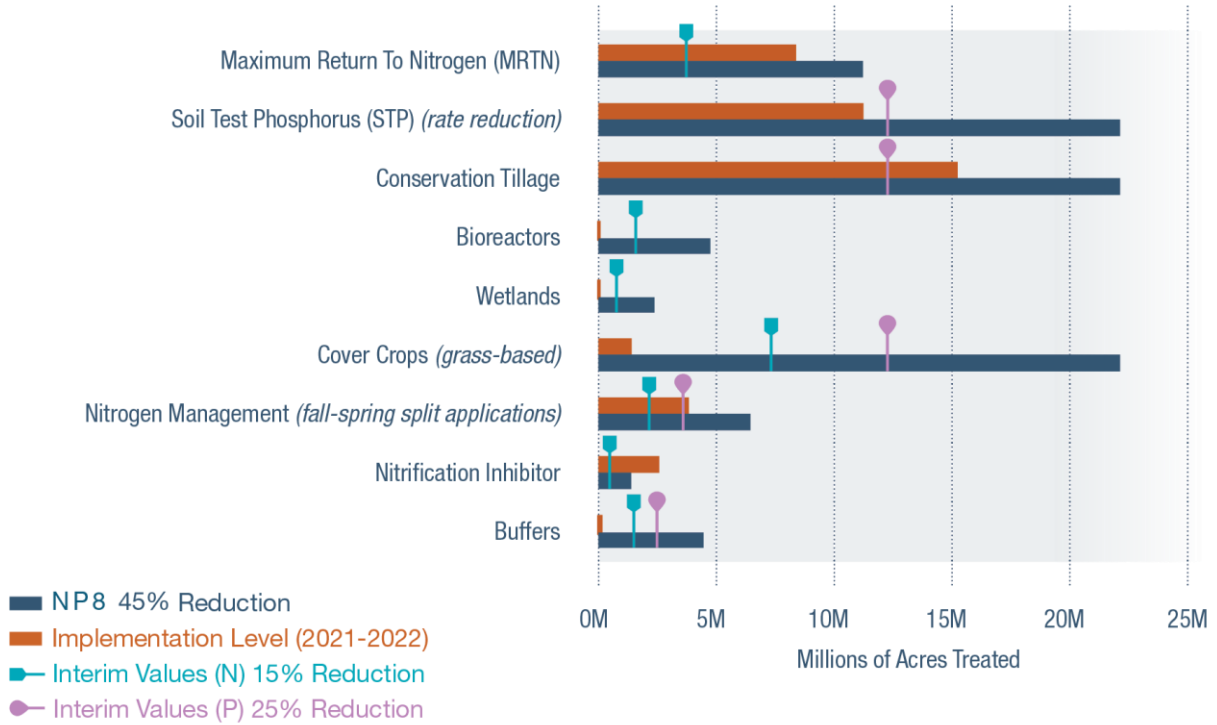


Figure 8.6. *Agricultural implementation as compared with scenario NP8*

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

Point Source Total Phosphorus Reductions

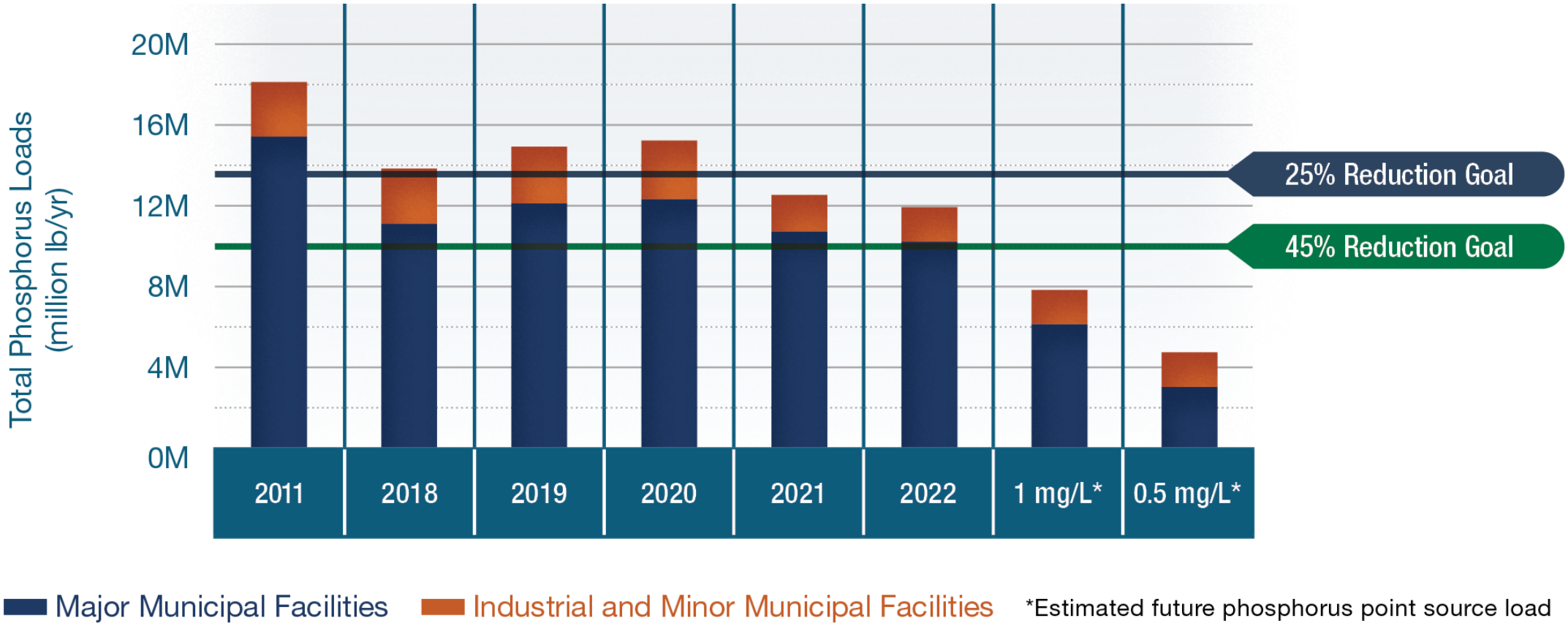


Figure 8.7. *Total phosphorus point source load relative to the 2025 interim and long-term reduction goals*

Moving Forward

- Policy Working Group and other workgroups and committees will continue to meet.
- Collaboration among agencies and organizations is encouraged to continue.
- Promote Planning and Implementation at the watershed scale.

Photo: Haley Haverback-Gruber

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

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