



Metropolitan Water Reclamation District of Greater Chicago

Welcome to the December
Edition of the 2021
M&R Seminar Series



ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY

NOTES FOR SEMINAR ATTENDEES

- All attendees' audio lines have been muted to minimize background noise.
- A question and answer session will follow the presentation.
- Please use the "Chat" feature to ask a question via text to "All Panelists."
- The presentation slides will be posted on the MWRD website after the seminar.
- This seminar has been approved by the ISPE for one PDH and approved by the IEPA for one TCH. Certificates will only be issued to participants who attend the entire presentation.

Trevor Sample
Project Manager, bureau of Water
Watershed Management Section
Illinois Environmental Protection Agency



Trevor Sample graduated from Illinois State University with a Bachelor of Science degree in Agronomy. He spent four years working in the seed industry before joining Illinois Environmental Protection Agency in Springfield, Illinois. He has worked in the Bureau of Water, Watershed Management Section for 20 years, serving as project manager in the Total Maximum Daily Load program and 319 Nonpoint Source grant program. He has served as the Agency Coordinator for the Illinois Nutrient Loss Reduction Strategy since 2017.



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Improving our
water resources
with collaboration
and innovation



Illinois Extension
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN



Photo: Layne Knoche



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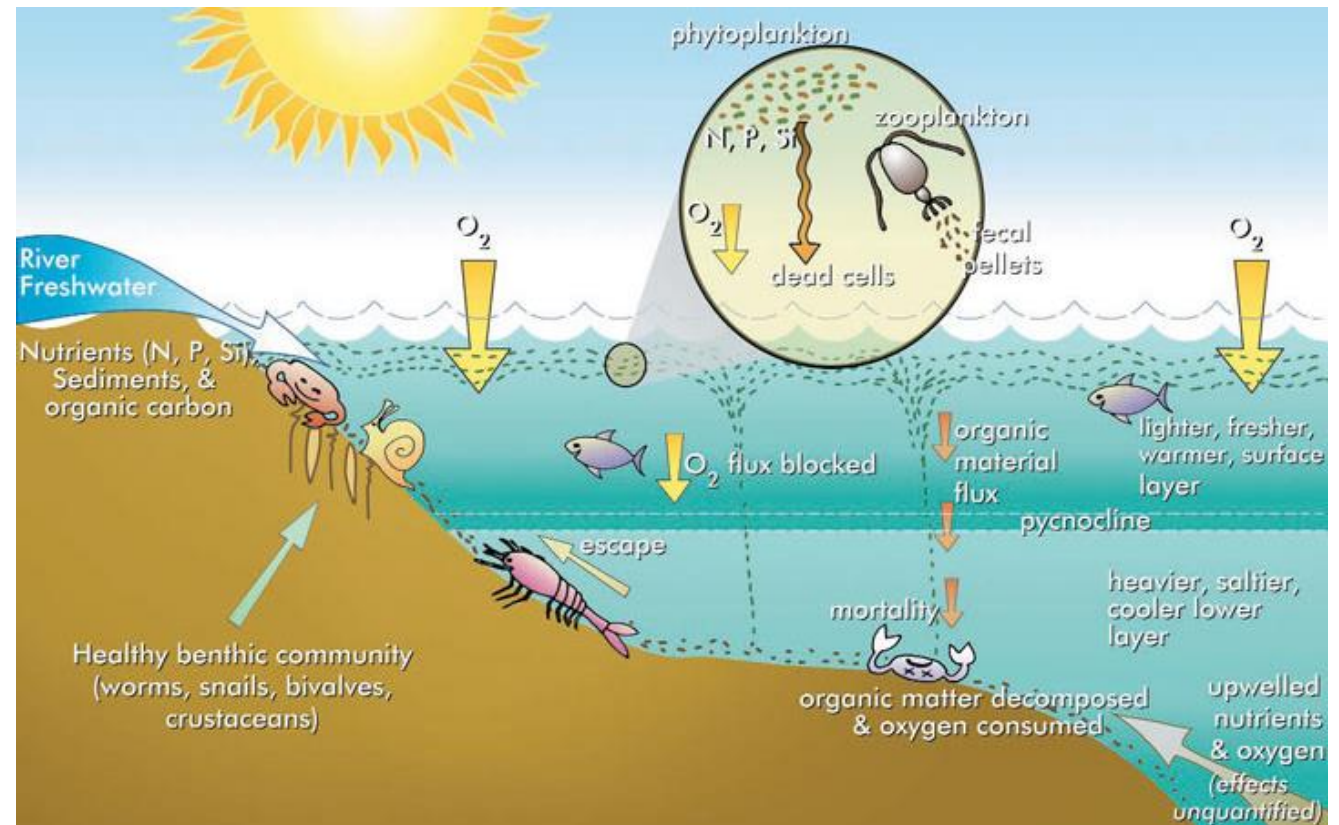
Key Points

- Overview of Illinois NLRS
- Gulf Hypoxia
- Nutrient Strategy Framework
- Illinois Process
 - Science Assessment
 - Policy Workgroup
 - Priorities & Approach
- Implementation of NLRS
- 2021 Biennial Report



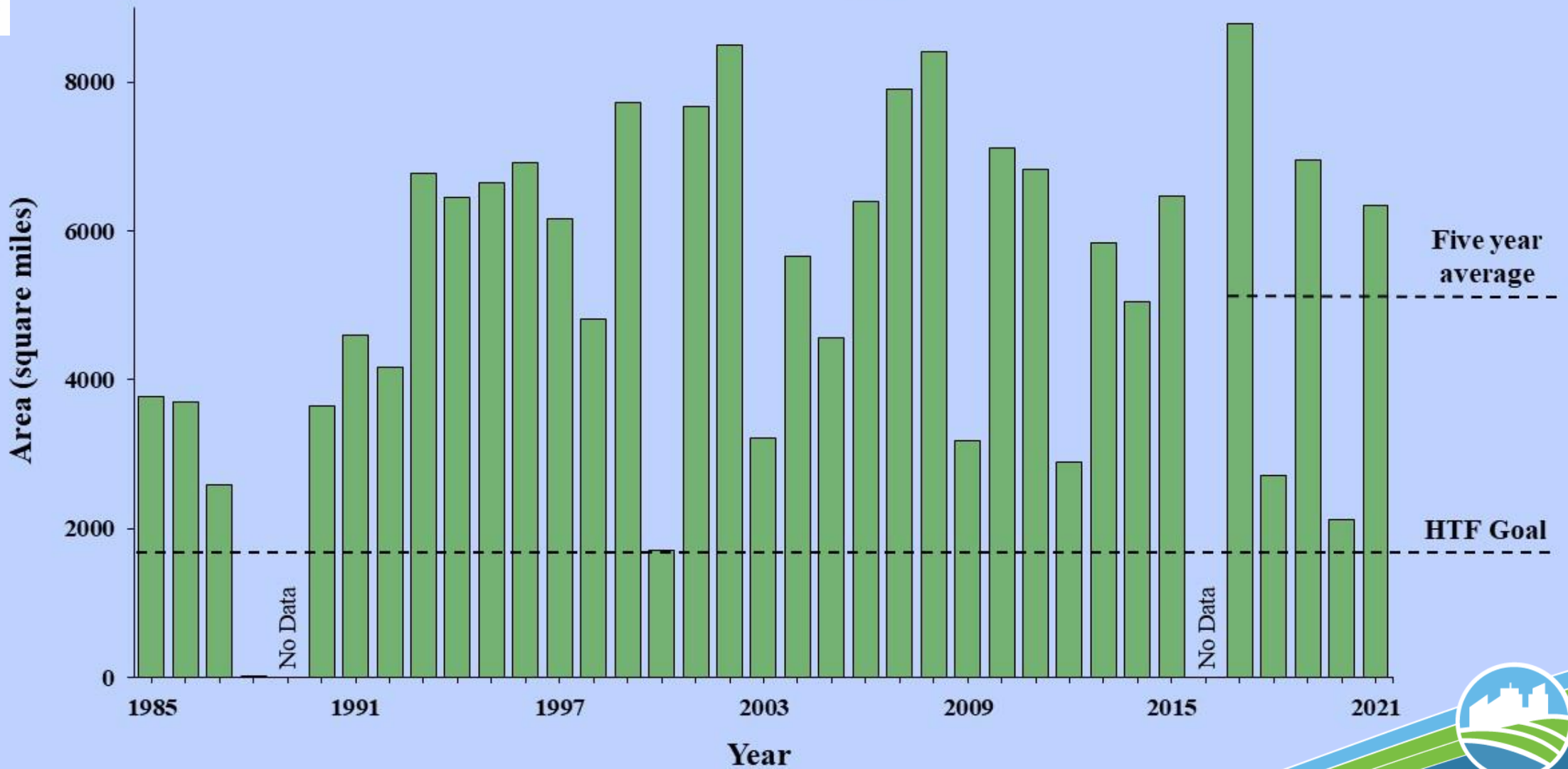
What causes hypoxia?

- 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



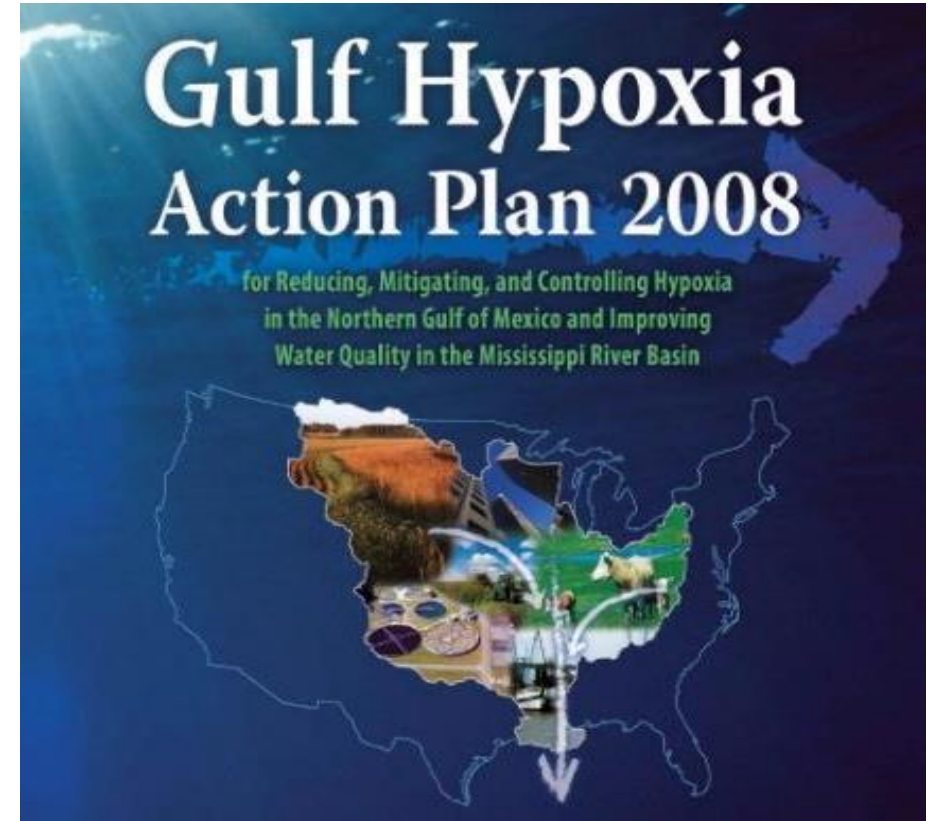


Bottom-Water Area of Hypoxia 1985-2021



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 by 45%**
- **Plan was later amended**
 - 20% reduction by 2025
 - 45% reduction by 2035



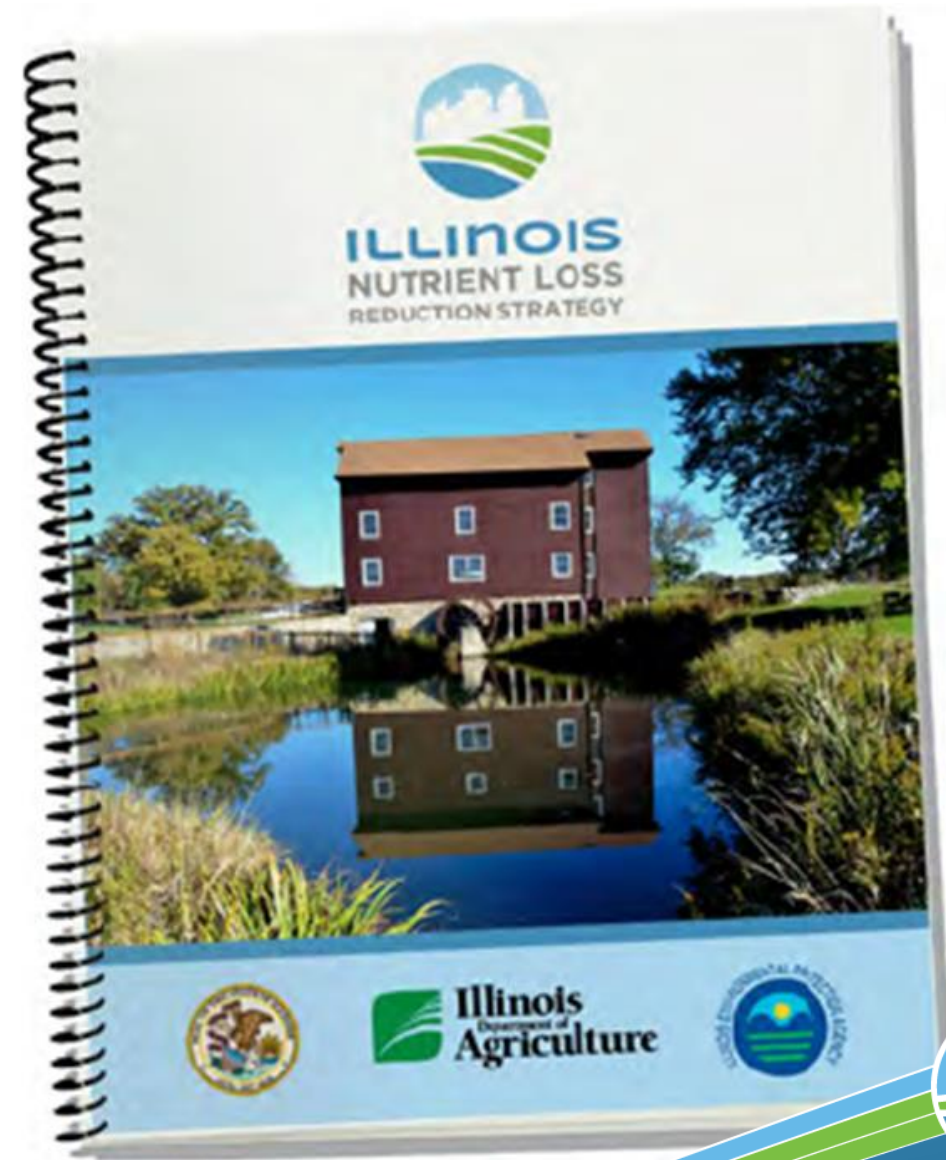
USEPA Nutrient Strategy Elements

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



Illinois Nutrient Loss Reduction Strategy

**NLRS REPORT
RELEASED JULY 2015**



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Illinois Nutrient Loss Reduction Strategy

GOALS

Establishes 45% Reduction of Nitrogen and Phosphorus
compared to 1980-1996 average baseline

Interim Milestone—2025

25% Reduction in Phosphorus Loads

15% Reduction in Nitrogen Loads



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

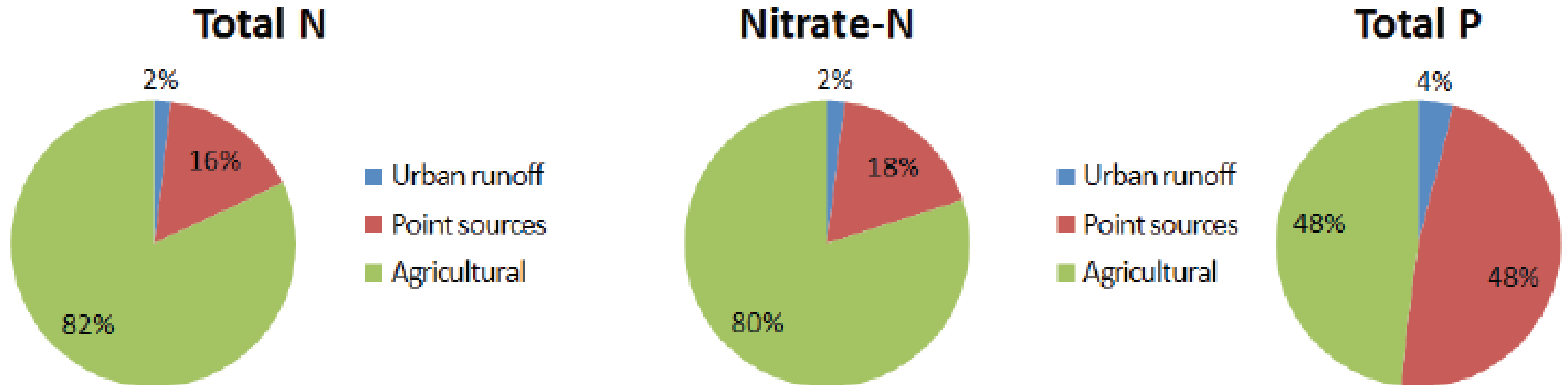
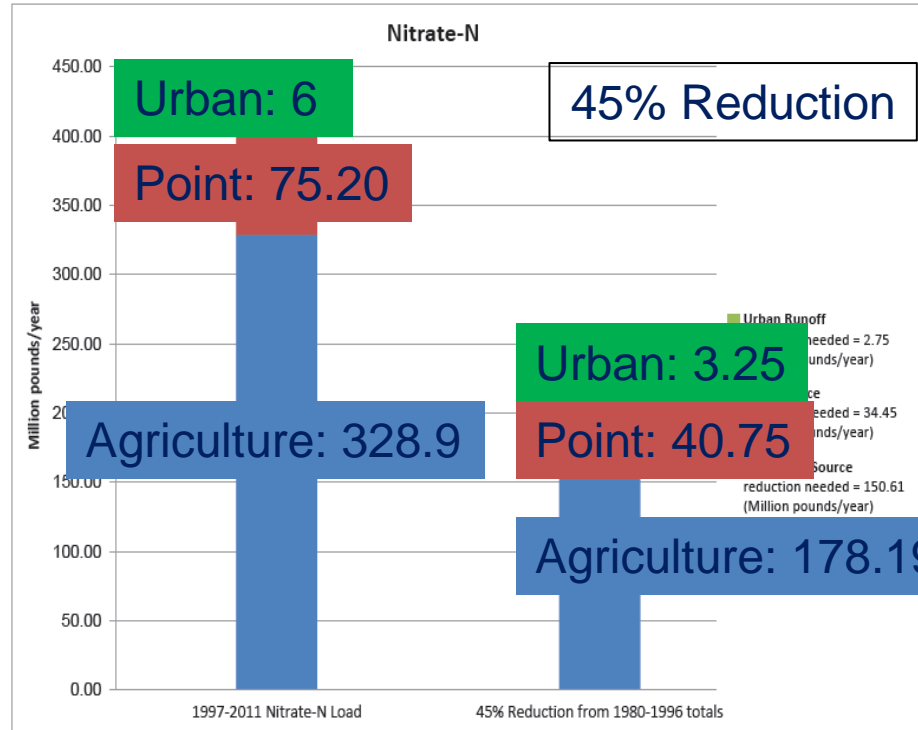


Figure 2.1. The proportion of nitrate and total phosphorus lost to the Mississippi River by source.

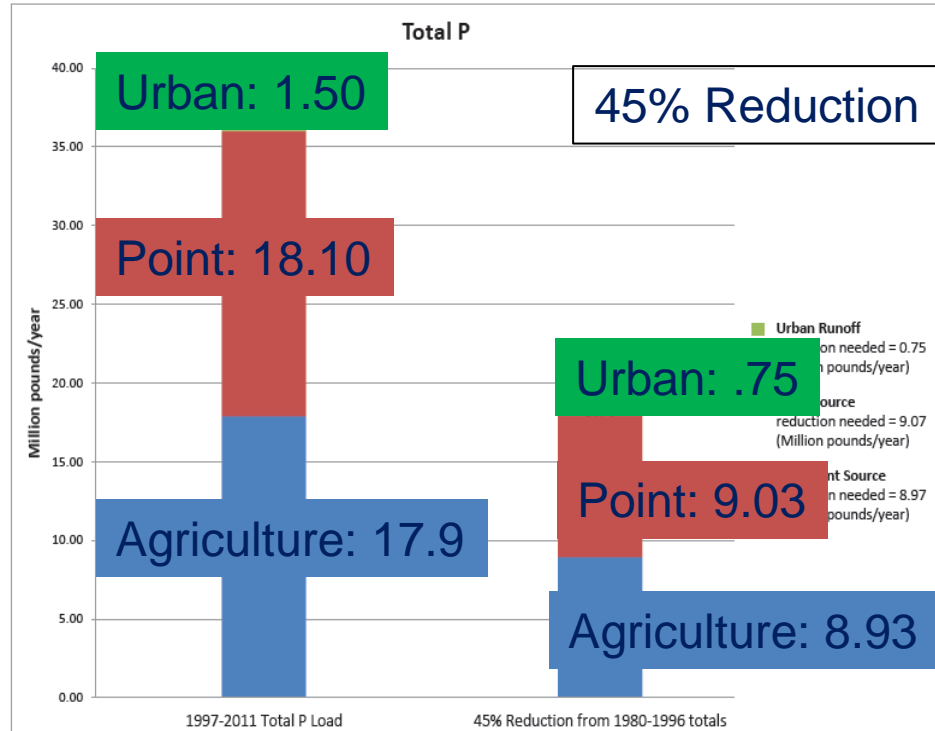


Nutrient Sources (Million Pounds Per Year)



Total: 410 M lbs/yr
Baseline

Total: 222 M lbs/yr
Goal

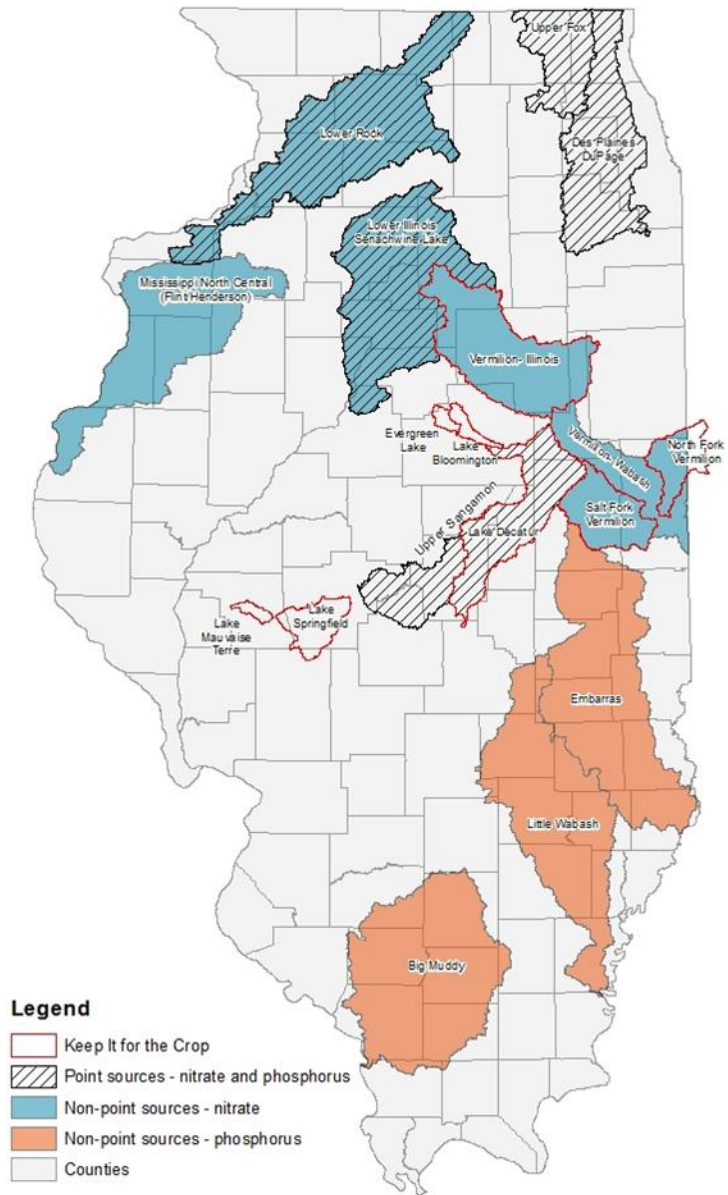


Total: 37.5 M lbs/yr
Baseline

Total: 18.7M lbs/yr
Goal



NLRS- Priority Watersheds



Prioritized by:

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



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
Edge of Field Practices	Woodchip Bioreactors Stream Buffers (non-tile drained land) Constructed Wetlands	Stream Buffers
Land Use Change	Perennial/Energy Crops	Perennial/Energy Crops



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



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



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



Illinois NLRs Policy Working Group Participants

Agriculture



Point Source



Stormwater and Potable Water System



Government

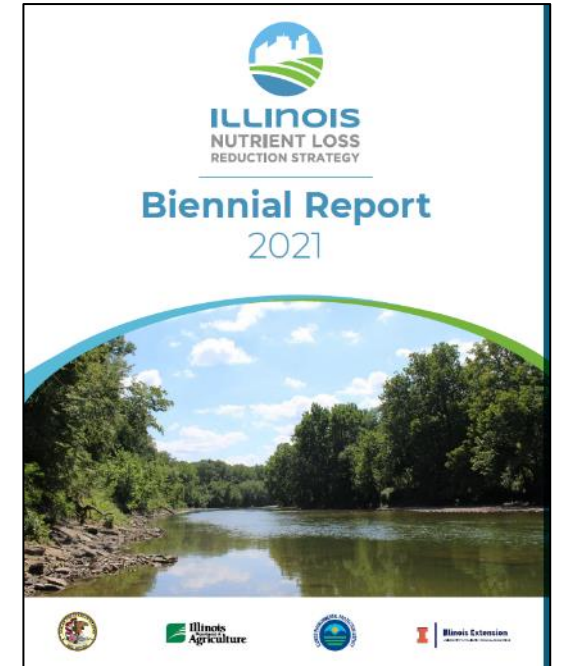
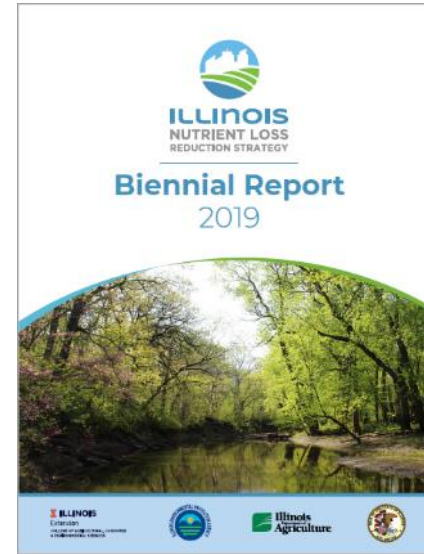
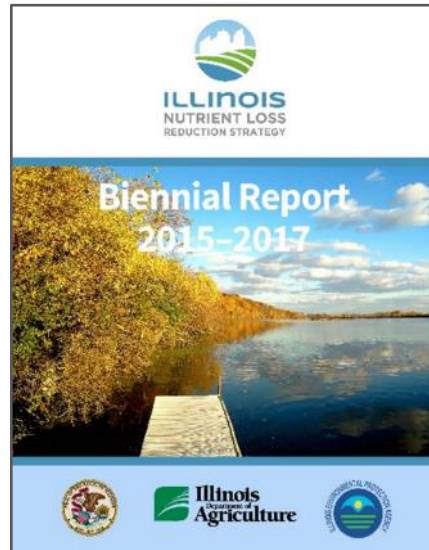


Environment/Conservation



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



2021 Biennial Report

(2019-2020 Reporting Years)

Released September 16, 2021



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2020 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

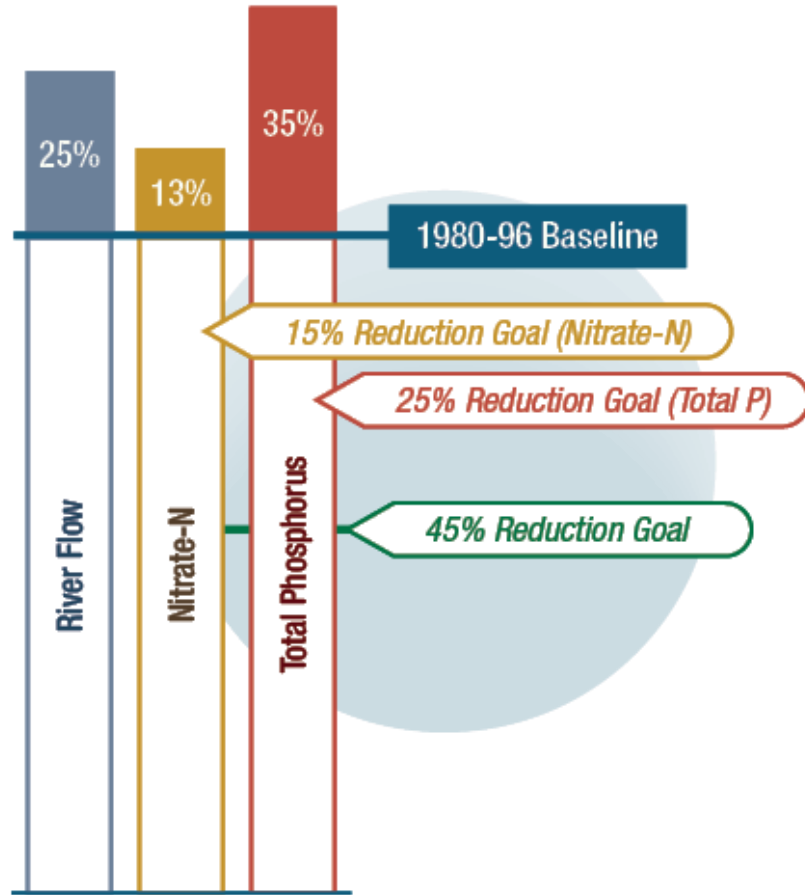
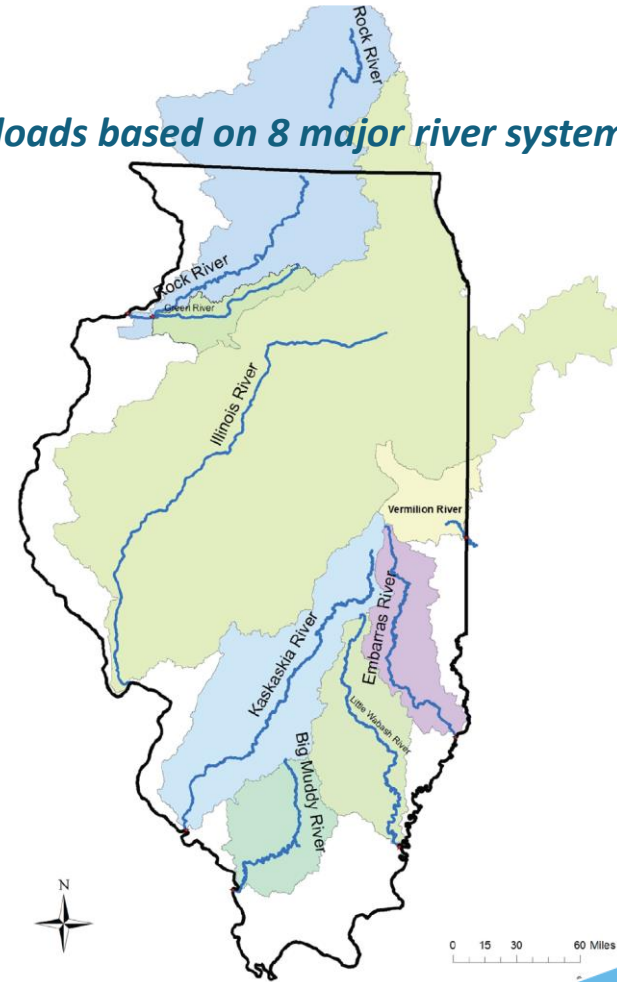


Figure 1.1. Percent increase from baseline to average 2015–19

Statewide loads based on 8 major river systems



Development of additional Implementation Scenarios

Scenario NP7 Interim Reduction Goals

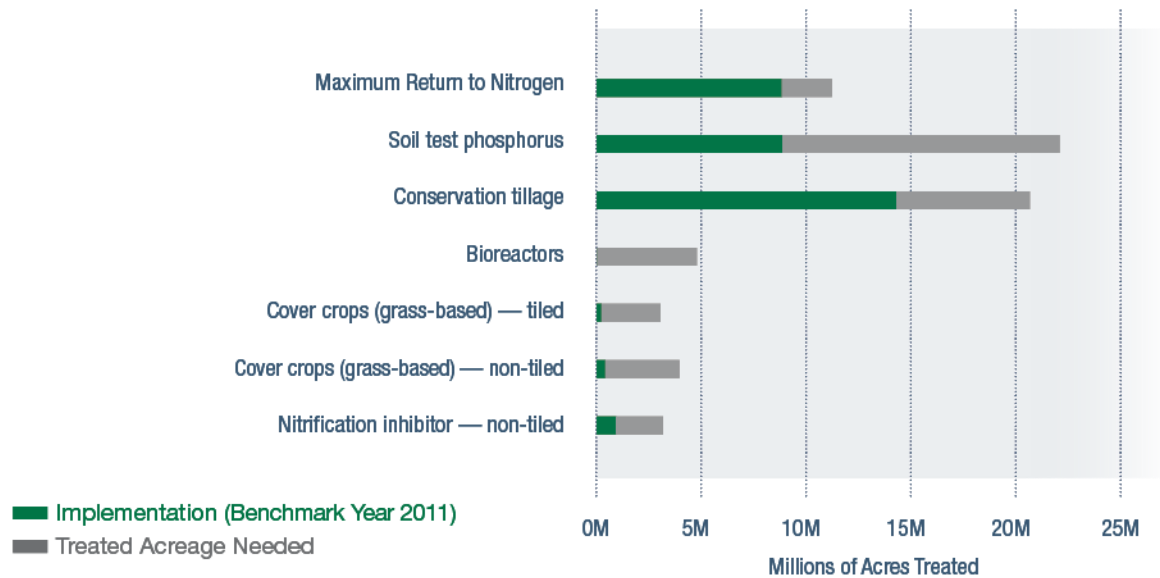


Figure 3.10. Interim combined nitrogen and phosphorus loss reduction scenario: acreage needed

Scenario NP8 45% Reduction Goal

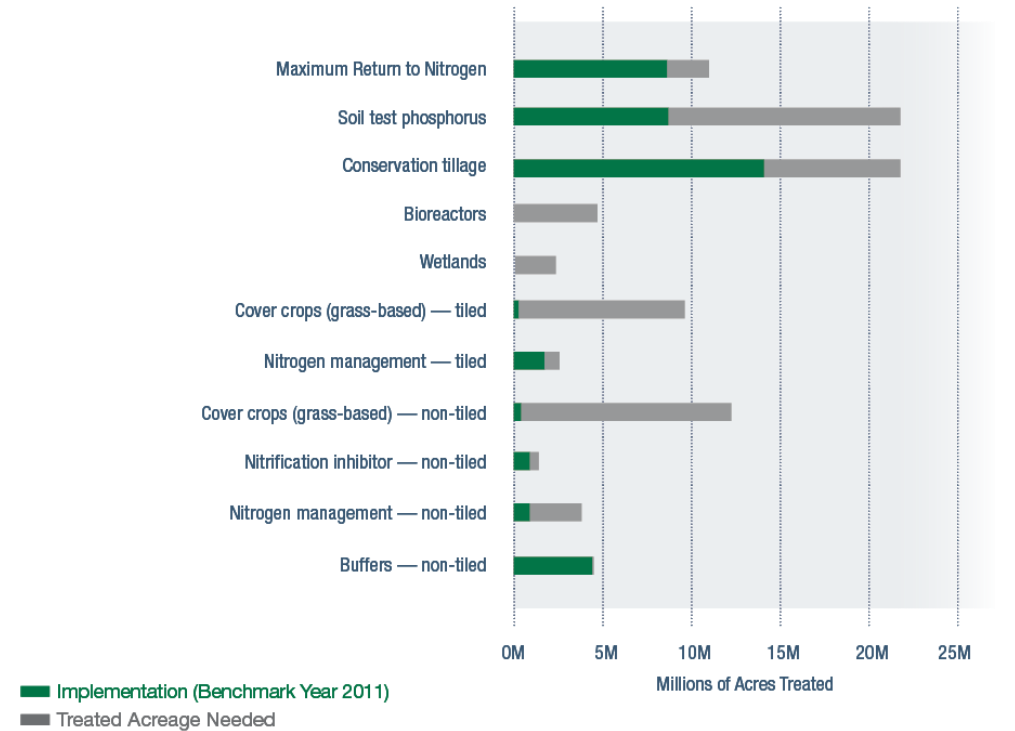


Figure 3.11. Full combined nitrogen and phosphorus loss reduction scenario: treatment area needed



Addition of Conservation Practices

- The Science Team at the University of Illinois developed a process for adding new practices or updating practice performance.
- Two practices have been approved and added to the list of recommended conservation practices for reducing nitrogen and phosphorus.

- Saturated Buffers
 - 40% nitrate reduction
- Terraces
 - 40% phosphorus reduction



Statewide Nutrient Export Loading Network



Stream Name	Location	Station Drainage Area in Illinois only, in mi ²
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

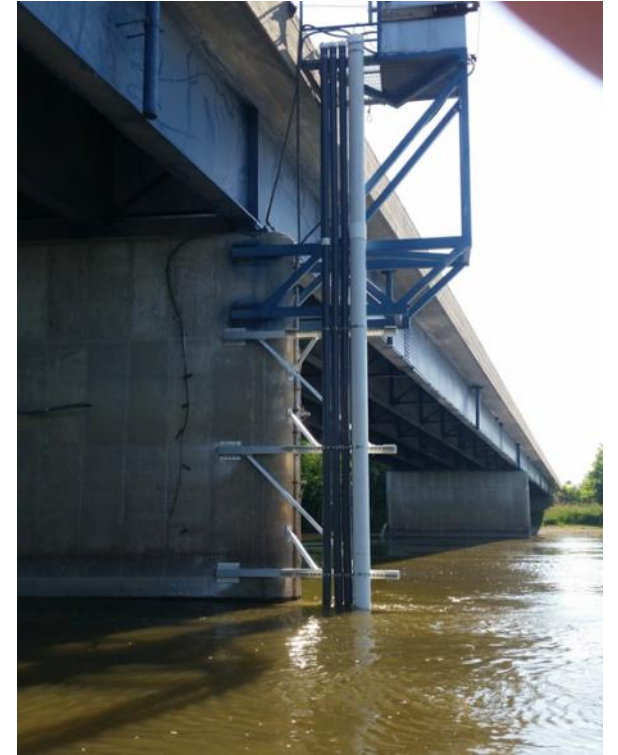


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“Super Gages”

Parameters (measured every 15 minutes)

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





CHAPTER 4

AGRICULTURAL SECTOR



Photo: Dennis Bowman



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Table 4.1. Funding resources in the agricultural sector

	2019	2020
Grants or Loans Received	\$2,874,170	\$5,366,883
Grants or Loans Given	\$7,764,110	\$8,100,700
Funded Programs	\$426,206	\$514,477
Total	\$11,064,486	\$13,982,060

Table 4.2. Outreach activities and associated attendance

Type of Outreach	2015-16		2017-18		2019-20	
	Number of Events	Total Attendance	Number of Events	Total Attendance	Number of Events	Total Attendance
Presentations	457	16,000	602	38,155	724	47,375
Field Days	130	3,692	204	18,493	118	11,760
Workshops	607	12,695	423	18,478	132	8,322
Conferences	27	6,935	42	9,355	46	4,623
Total	1,221	39,322	1,271	84,481	1,020	72,080

RESOURCES



OUTREACH



Photo: Jennifer Jones



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NLRS NASS Survey 2020

Based on 2019 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 third 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
2020	Nutrient Loss Reduction Strategy	26.9%	29.9%	20.7%	10.7%	11.8%
	MRTN Strategy	30.2%	29.0%	17.6%	14.7%	8.5%
	Woodchip Bioreactors	54.7%	17.2%	14.4%	11.5%	2.2%
	Constructed Wetlands	42.1%	20.5%	16.5%	17.9%	3%
	Cover Crop Management	9.1%	24.7%	27.7%	26.1%	12.4%
2019	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	15.2%	16.7%	35.5%	28.4%	4.2%





Table 4.13. Acres with a nitrogen management strategy

	Acres in 2011	Acres in 2015	Acres in 2017	Acres in 2019
Acres of corn planted	12,600,000	11,700,000	11,200,000	10,500,000
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
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



Table 4.14. Fertilizer application strategies for corn on tilled acres



	Acres in 2011	Acres in 2015	Acres in 2017	Acres in 2019
Acres of corn planted	12,600,000	11,700,000	11,200,000	10,500,000
Fall/winter nitrogen was applied with a nitrification inhibitor	3,240,000 or 26% of planted acres	2,970,000 or 25% of planted acres	3,550,000 or 32% of planted acres	1,460,000 or 14% of planted acres
Spring nitrogen was applied with a nitrification inhibitor	Not asked	Not asked	2,790,000 or 25% of planted acres	2,220,000 or 21% of planted acres

Table 4.15. Fertilizer application strategies for corn on non-tiled acres

	Acres in 2011	Acres in 2015	Acres in 2017	Acres in 2019
Acres of corn planted	12,600,000	11,700,000	11,200,000	10,500,000
Fall/winter nitrogen was applied with a nitrification inhibitor	Not asked	Not asked	1,040,000 or 9% of planted acres	540,000 or 5% of planted acres
Spring nitrogen was applied with a nitrification inhibitor	Not asked	Not asked	1,040,000 or 9% of planted acres	2,070,000 or 20% of planted acres





Table 4.16. Fertilizer application strategies for corn on tilled acres

	Acres in 2011	Acres in 2015	Acres in 2017	Acres in 2019
Acres of corn planted	12,600,000	11,700,000	11,200,000	10,500,000
STRATEGY 1 – Fall/winter nitrogen was 50% or less of total nitrogen	940,000 or 7% of planted acres	950,000 or 8% of planted acres	780,000 or 7% of planted acres	330,000 or 3% of planted acres
STRATEGY 2 – Fall/winter nitrogen was 0% of total nitrogen (all spring applications)	2,480,000 or 20% of planted acres	2,660,000 or 23% of planted acres	1,850,000 or 17% of planted acres	1,720,000 or 16% of planted acres
STRATEGY 3 – Less than 50% fall/winter applications, with remaining nitrogen applications split between pre-plant and sidedress applications	1,730,000 or 14% of planted acres	2,220,000 or 19% of planted acres	1,790,000 or 16% of planted acres	1,930,000 or 18% of planted acres

Table 4.17. Fertilizer application strategies for corn on non-tiled acres

	Acres in 2011	Acres in 2015	Acres in 2017	Acres in 2019
Acres of corn planted	12,600,000	11,700,000	11,200,000	10,500,000
STRATEGY 1 – Fall/winter nitrogen was 50% or less of total nitrogen	Not asked	Not asked	340,000 or 3% of planted acres	110,000 or 1% of planted acres
STRATEGY 2 – Fall/winter nitrogen was 0% of total nitrogen (all spring applications)	Not asked	Not asked	1,250,000 or 11% of planted acres	990,000 or 9% of planted acres
STRATEGY 3 – Less than 50% fall/winter applications, with remaining nitrogen applications split between pre-plant and sidedress applications	Not asked	Not asked	930,000 or 8% of planted acres	740,000 or 7% of planted acres





Table 4.20. Cover crop questions for tilled and non-tiled acres



	Acres
Corn/soybean acres planted to cover crops after the 2019 crop season on tilled 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 tilled 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 tilled 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 tilled ground	220,000
Corn/soybean acres planted to cover crops after the 2011 crop season on non-tiled ground	380,000



Agriculture Sector: State and Federal Cost-Share Programs



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



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Conservation Reserve Program

Table 4.4. Acres in CRP wetlands and buffers

	2011	2015	2016	2017	2018	2019	2020
CRP Wetlands	57,463	45,790	27,616	43,826	55,716	55,536	57,867
CRP Buffers	145,813	279,534	197,442	270,002	265,753	257,047	250,784

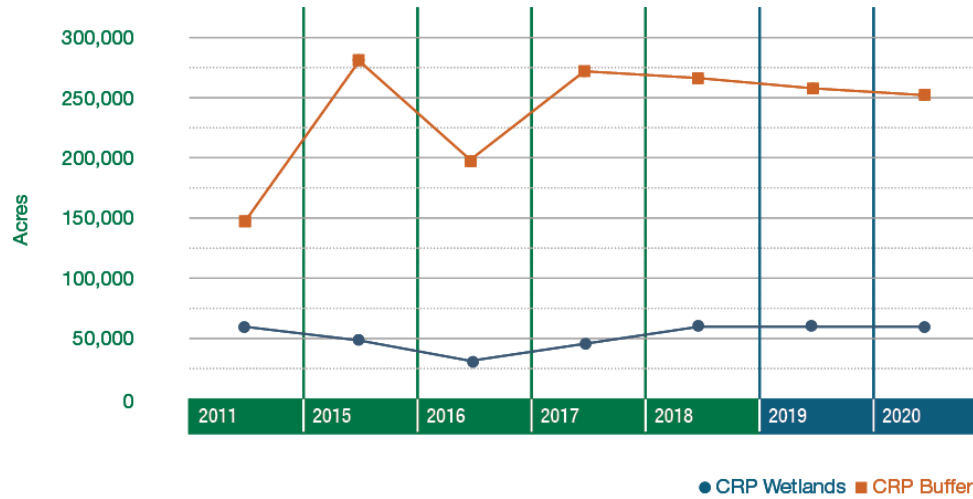
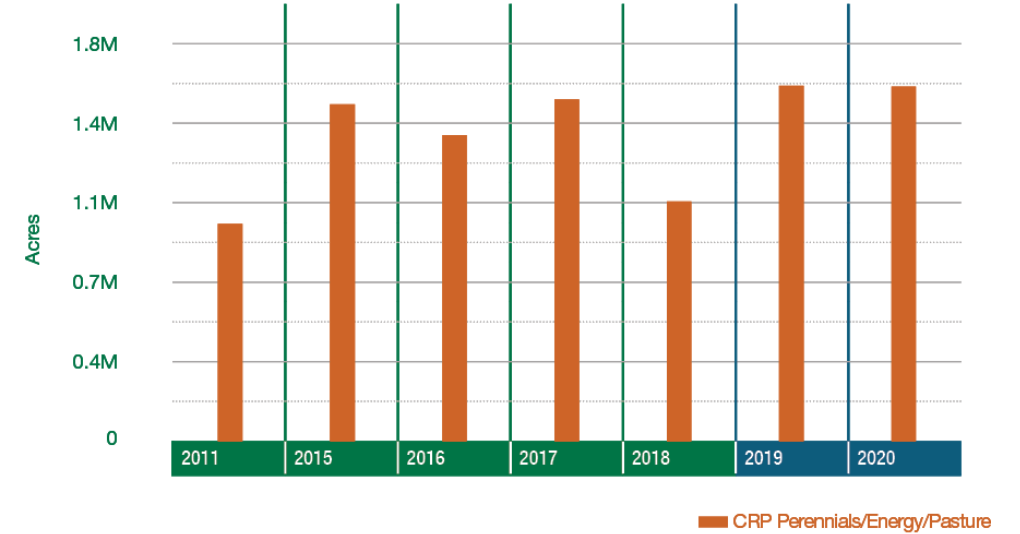


Table 4.5. Acres in CRP perennials/energy/pasture

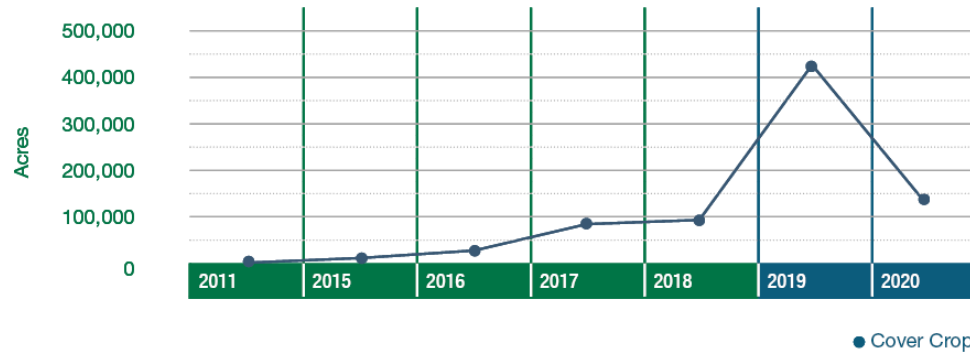
	2011	2015	2016	2017	2018	2019	2020
CRP Perennials/ Energy/Pasture	985,531	1,524,379	1,386,378	1,547,612	1,086,474	1,606,621	1,586,263



Cover Crops

Table 4.6. Acres in cover crops reported by producers to FSA

	2011	2015	2016	2017	2018	2019	2020
Cover Crops	768	11,064	27,064	83,980	92,970	427,410	131,757





Environmental Quality Incentives Program

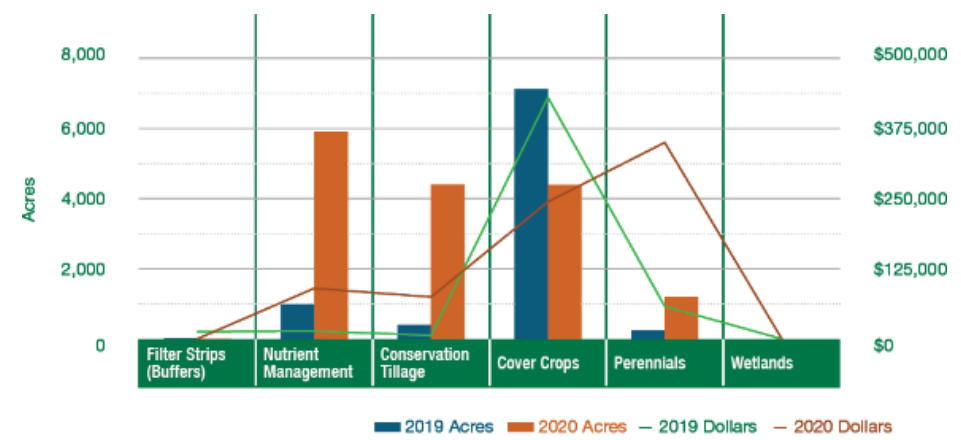
Conservation Stewardship Program

Table 4.8. Acres implemented and dollars spent on nutrient conservation practices through EQIP

	2019 Acres	2019 Dollars	2020 Acres	2020 Dollars
Filter Strips (Buffers)	23.1	\$12,718	0.4	\$243
Nutrient Management	997	\$14,089	5,931	\$90,326
Conservation Tillage	398	\$6,382	4,418	\$75,327
Cover Crops	7,147	\$432,242	4,400	\$245,247
Perennials	244	\$58,373	1,205	\$351,273
Wetlands	0	\$0	0	\$0

Table 4.9. New acres enrolled in CSP

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Acres per Year	165,416	229,815	188,731	399,024	214,557	160,172	149,844	200,455	122,638	182,904
Subtracting the 5-Year Drop-Off	165,416	395,231	583,962	982,986	1,197,543	1,192,299	1,112,328	1,124,052	847,666	816,013
Cumulative Acres	165,416	395,231	583,962	982,986	1,197,543	1,357,715	1,507,559	1,708,014	1,830,652	2,013,556



Data source: NRCS At a Glance

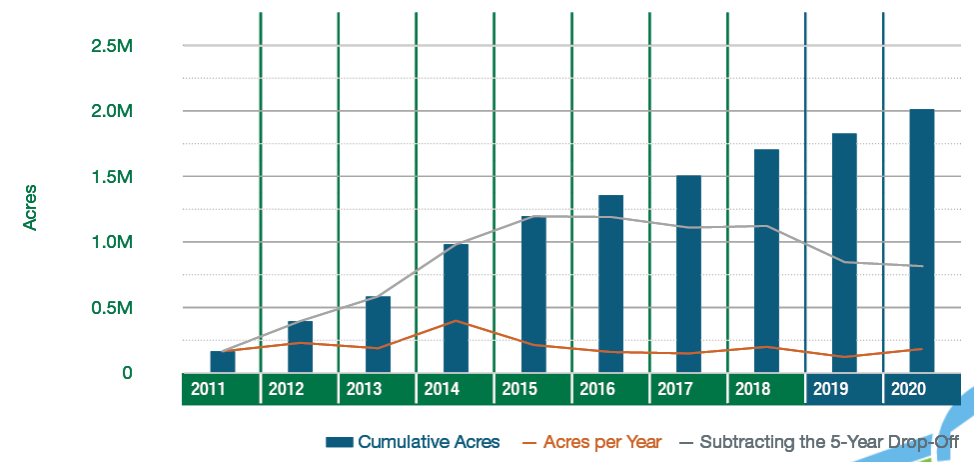


Figure 4.5. Acres implemented and dollars spent on nutrient conservation practices through EQIP

Figure 4.6. Acres enrolled in CSP, 2011-20





Wetland Reserve Easement Program

Table 4.11. New wetland acres enrolled in WREP

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Acres per Year	1,788	1,420	569	305	396	1,237	2,600	260	1,403	1,509
Cumulative Acres	1,788	3,208	3,777	4,082	4,478	5,715	8,315	8,575	9,978	11,487

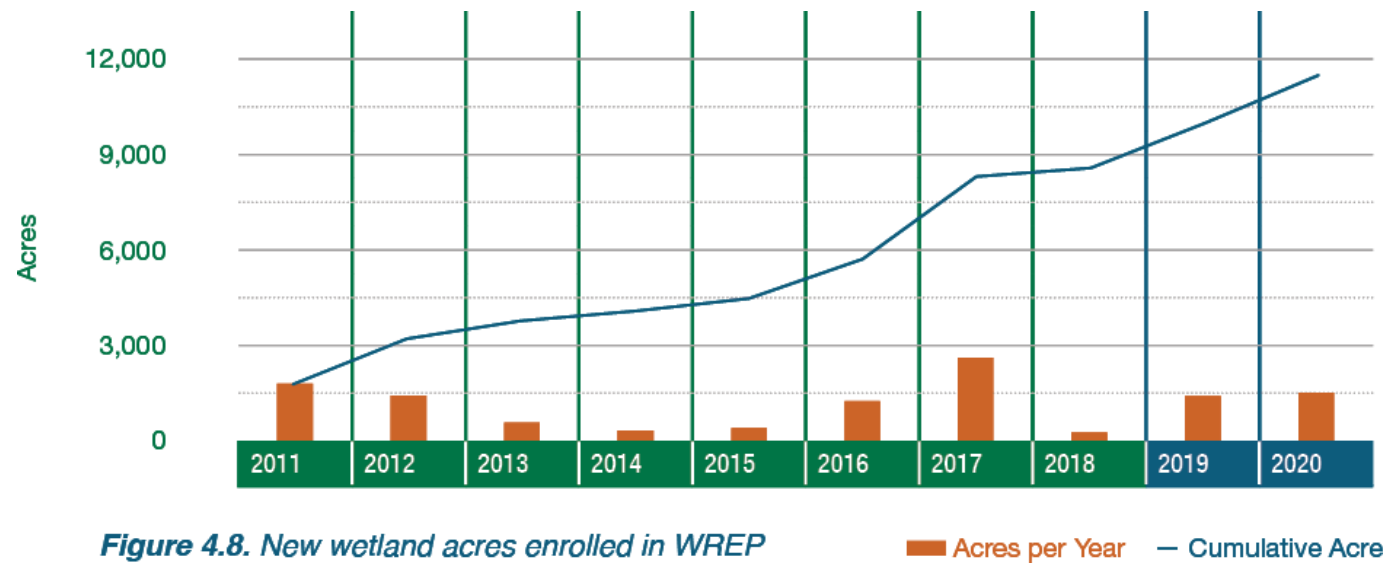


Figure 4.8. New wetland acres enrolled in WREP

■ Acres per Year
 — Cumulative Acres





Conservation Reserve Enhancement Program

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Wetlands	20	651	3,681	11,976	17,406	19,467	19,523	19,523	19,523	19,528
Buffers	526	1,324	2,720	5,467	8,768	13,568	13,764	13,850	13,855	13,855
Perennials/ Energy	0	7	84	1,622	2,107	4,395	4,670	4,718	4,726	4,726

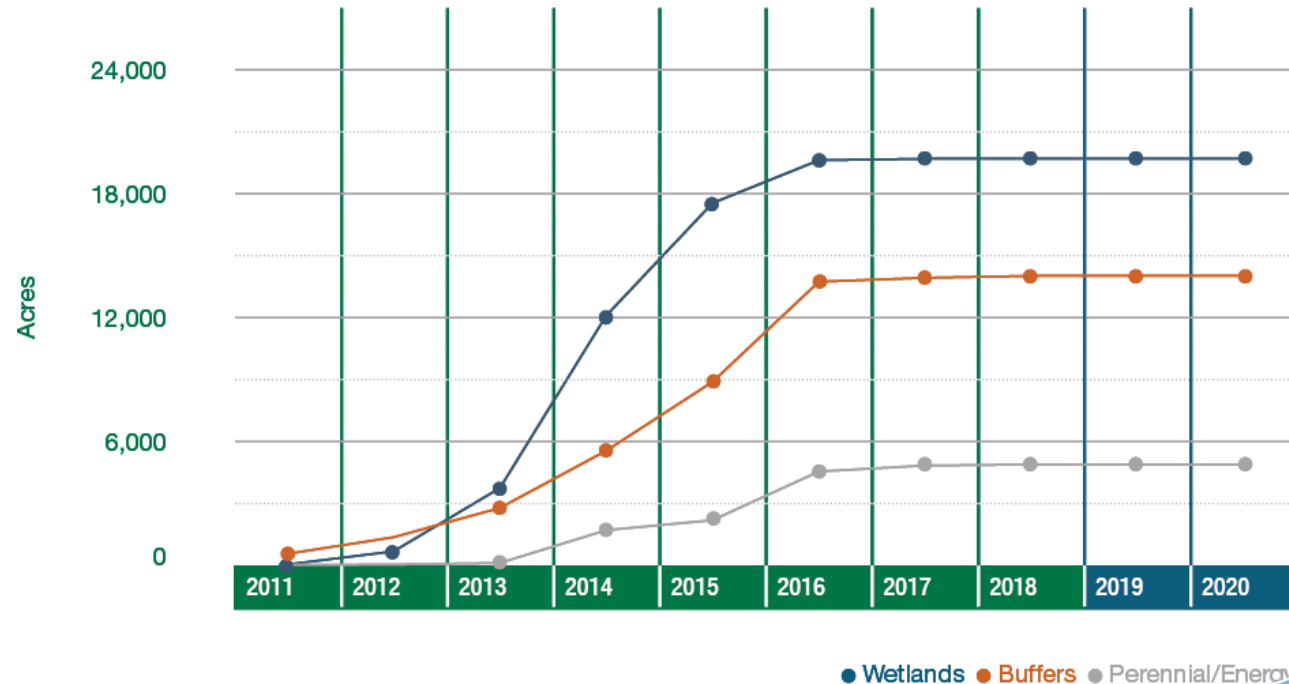


Figure 4.19. Acres with Illinois CREP easements





Table 4.23. Acres treated by and dollars spent on PFC in 2019 and 2020

	Bioreactors	Wetlands	Filter Strips	Tillage	Perennials	Cover Crops
2019 Acres	0	0	0	535.3	153.81	15,472.48
2019 Cost-Share Dollars	\$0	\$0	\$0	\$2,219.20	\$14,560.85	\$347,678.85
2019 Land Owner Dollars	\$0	\$0	\$0	\$1,249.84	\$10,927.59	\$294,069.77
2020 Acres	0	0	0	4,045.56	443.36	17,945.38
2020 Cost-Share Dollars	\$0	\$0	\$0	\$26,253.58	\$83,014.78	\$426,980.26
2020 Land Owner Dollars	\$0	\$0	\$0	\$38,705.83	\$46,090.05	\$358,703.96





319 Nonpoint Source Grant Program



Table 4.24. Acres treated by agricultural practices installed under the Section 319 grant program 2011-20

	Conservation Tillage	Cover and Green Manure Crop	Filter Strip	Nutrient Management	Wetland Restoration	Total
2011	-	-	-	-	24	24
2012	9,998	-	-	-	255	10,253
2013	-	-	-	-	380	380
2014	-	453	-	-	116	569
2015	-	2,544	8	-	164	2,716
2016	-	2,583	8	3,062	1	5,654
2017	151	3,978	3	-	1	4,133
2018	-	1,570	9	5,713	1	7,293
2019	-	1,151.34	0.5	6,521.5	-	7,673.34
2020	-	15	-	-	-	15





University of Illinois

By the end of 2020,
42 known Woodchip
Bioreactors treating
1,460 acres



Photo: Janith Chandrasoma



Partner Updates



ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY



CHAPTER 5

POINT SOURCE SECTOR



Photo: Fox Metro Water Reclamation District



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Resources

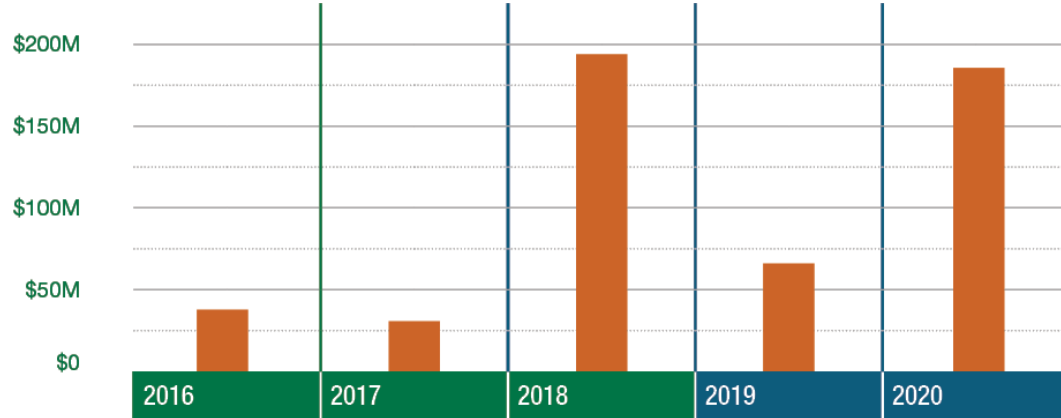


Figure 5.1. Point source spending comparison for 2016, 2017, 2018, 2019, and 2020

Table 5.1. Funds supporting 2019-20 nutrient reduction-related activities in the point source sector for IAWA reporting agencies and watershed groups

Nutrient Reduction-Related Activity	2019 Totals	2020 Totals
Capital improvement	\$60,175,432	\$181,581,773
Operations and maintenance	\$2,098,370	\$665,178
Feasibility studies or permit-required projects	\$279,723	\$253,056
Staff	\$2,357,845	\$2,521,000
Other	\$221,550	\$192,215
Total	\$65,132,920	\$185,213,223



Outreach



Table 5.2. 2019-20 point source outreach activities reported by IAWA facilities and watershed groups

Type of Activity	Number of Events	Attendance
Field Days	2	35
Presentations	9	2,228
Workshops	3	400
Total	14	2,663

The point source sector's outreach activities reflect enhanced collaborations with stakeholders, including information on Nutrient Assessment Reduction Plans

Metropolitan Water Reclamation District of Greater Chicago conducted extensive public education emphasizing the research and implementation of nutrient loss strategies through press release, website, and social media campaigns



Point Source Updates



- 2019 and 2020 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





Point Source Nutrient Loads

- 2019 and 2020 Nutrient Loads from point sources were calculated by Illinois EPA using a combination of monthly Discharge Monitoring Reports (DMR) and USEPA nutrient loading tools.
- Wastewater facilities required to submit monthly water quality data to Illinois EPA. Most major municipal facilities are required to submit total nitrogen and total phosphorus concentrations.
- Major facility= Discharge ≥ 1 million gallons per day
- Major Municipal facilities
 - 2019: 210
 - 2020: 211





Industrial Wastewater Treatment Facilities

- For Industrial Wastewater Facilities, USEPA Water Pollutant Loading Tool was used to calculate annual nutrient loads
 - Uses DMR data to auto-calculate annual loads
- 2019
 - 17 Majors, 313 minors with nitrogen loads
 - 11 Majors, 50 minors with phosphorus loads
- 2020
 - 18 Majors, 300 minors with nitrogen loads
 - 13 Majors, 49 minors with phosphorus loads





Point Source Updates

Table 5.3. Statewide total phosphorus loads from the point source sector in 2019

Point Source Sector	Total Phosphorus Load (million lb/yr)
2011 Baseline	18.1
2019 Total Phosphorus Load	14.9
> 210 Major Municipals	12.1
> Minor Municipals	2.4
> Major and Minor Industrials	0.4
Reductions from 2011 Baseline	3.2 (18%)

Table 5.4. Statewide total phosphorus loads from the point source sector in 2020

Point Source Sector	Total Phosphorus Load (million lb/yr)
2011 Baseline	18.1
2020 Total Phosphorus Load	15.2
> 211 Major Municipals	12.3
> Minor Municipals	2.4
> Major and Minor Industrials	0.5
Reductions from 2011 Baseline	2.9 (16%)

2020: 16% Total Phosphorus Reduction

Compare to 2018 24% reduction





Point Source Updates

Table 5.7. Statewide total nitrogen loads from the point source sector in 2019 and 2020

Point Source Sector	Total Nitrogen Load (million lb/yr)	Reduction From Baseline Load (million lb/yr)
2011 Baseline	87.3	
2019 Total Nitrogen Load > 210 Major Municipals > Minor Municipals > Major and Minor Industrials	85.8 80.7 3 2.1	1.5 (1.7%)
2020 Total Nitrogen Load > 211 Major Municipals > Minor Municipals > Major and Minor Industrials	83.2 78 3 2.2	4.1 (4.7%)

2020: 4.7% Total Nitrogen Reduction

Compare to 2018 10% reduction





Total Phosphorus Reduction from Individual Municipal Wastewater Facilities

In 2019,
82 facilities

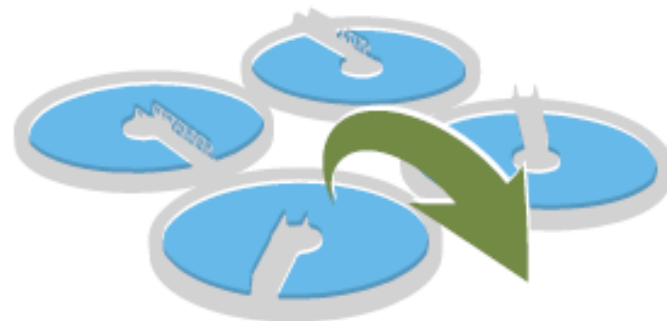
had an annual average total phosphorus concentration of 1 mg/L or less.

32 Facilities \leq 0.5 mg/L

In 2020,
90 facilities

had an annual average total phosphorus concentration of 1 mg/L or less.

31 Facilities \leq 0.5 mg/L



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2020 Top 10 Major Municipal Facilities Total Phosphorus Loads

NPDES Permit	Facility Name	Baseline 2011 TP Load (lb/yr)	2017 TP Load (lb/yr)	2018 TP Load (lb/yr)	2019 TP Load (lb/yr)	2020 TP Load (lb/yr)	Change from 2011
IL0028061	MWRDGC – Calumet	2,450,714	1,705,544	1,990,902	2,191,160	2,569,259	5%
IL0028053	MWRDGC – Stickney	2,351,312	1,288,296	707,230	2,164,828	2,435,218	4%
IL0028321*	Sanitary District of Decatur	1,562,750	1,770,422	2,022,573	2,011,785	1,897,809	21%
IL0028088	MWRDGC – O’Brien	969,075	916,335	931,333	947,758	978,314	1%
IL0027201	Rock River Water Reclamation District	971,083	232,702	280,051	231,141	223,527	-77%
IL0036340*	MWRDGC – Egan	233,759	206,963	209,074	219,942	210,437	-10%
IL0033481	Granite City, City of	126,431	133,683	330,034	86,593	180,081	42%
IL0028657	Fox River Water Reclamation District	171,050	184,605	171,000	187,850	173,032	1%
IL0034061	Naperville, City of	190,457	163,870	166,060	155,307	162,805	-15%
IL0027731	Bloomington/Normal Water Reclamation District	139,207	130,866	101,236	132,693	124,924	-10%

Top 10 facilities comprise 59% of the statewide point source phosphorus load

*Data provided by facility





2020 Top 10 Major Municipal Facilities Total Phosphorus Loads (Flow and Concentrations)

NPDES Permit	Facility Name	2019 Avg Flow (MGD)	2019 Avg TP Conc. (mg/L)	2020 Avg Flow (MGD)	2020 Avg TP Conc. (mg/L)
IL0028061	MWRDGC – Calumet	307	2.44	264	3.54
IL0028053	MWRDGC – Stickney	816	0.95	688	1.21
IL0028321*	Sanitary District of Decatur	39	17.18	37	16.96
IL0028088	MWRDGC – O’Brien	257	1.25	207	1.61
IL0027201	Rock River Water Reclamation District	22	1.76	19	2.08
IL0036340*	MWRDGC – Egan	28	2.70	24	3.10
IL0033481	Granite City, City of	19	1.52	15	5.07
IL0028657	Fox River Water Reclamation District	20	3.15	18	3.37
IL0034061	Naperville, City of	22	2.33	20	2.73
IL0027731	Bloomington/ Normal Water Reclamation District	20	2.28	17	2.72



*Data provided by facility



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NUTRIENT LOSS
REDUCTION STRATEGY

Flow and Nutrient Concentrations



Table 5.8. Total annual flow for major municipal facilities

Year	Total Million Gallons	Percent Change From Previous Year
2018	813,636	—
2019	925,667	13.8%
2020	779,145	-15.8%

Table 5.9. Average annual total phosphorus concentrations for major municipal facilities

Year	Total Phosphorus Concentration (mg/L)	Percent Change From Previous Year
2018	2.00	—
2019	1.55	-22.50%
2020	1.72	11.00%

Table 5.10. Average annual total nitrogen concentrations for major municipal facilities

Year	Total Nitrogen Concentration (mg/L)	Percent Change From Previous Year
2018	9.34	—
2019	11.6	25.00%
2020	13.07	12.70%





Metropolitan Water Reclamation District of Greater Chicago

- 2019 Biennial Report showed 24% statewide reduction in phosphorus from point sources from 2011-2018

NPDES Permit	Facility Name	Baseline 2011 TP Load (lb/yr)	2017 TP Load (lb/yr)	2018 TP Load (lb/yr)	2019 TP Load (lb/yr)	2020 TP Load (lb/yr)	Change from 2011
IL0028053	MWRDGC – Stickney	2,351,312	1,288,296	707,230	2,164,828	2,435,218	4%

- Increase in load from Stickney is responsible for a majority of the increase in statewide phosphorus load since 2018





Metropolitan Water Reclamation District of Greater Chicago

- Biological nutrient removal system installed at Stickney facility in 2014 and optimized in 2018, resulting in 95% phosphorus removal.
- Problems arose in 2019 that resulted in the system being halted and slowly restarted.
- Chemical phosphorus removal system was installed
- Permit limit 1.0 mg/L total phosphorus became affective in August 2021.
- Calumet Facility is currently designing a chemical phosphorus removal system.
 - Permit includes schedule to achieve 1.0 mg/L total phosphorus January 2024





Point Source Updates

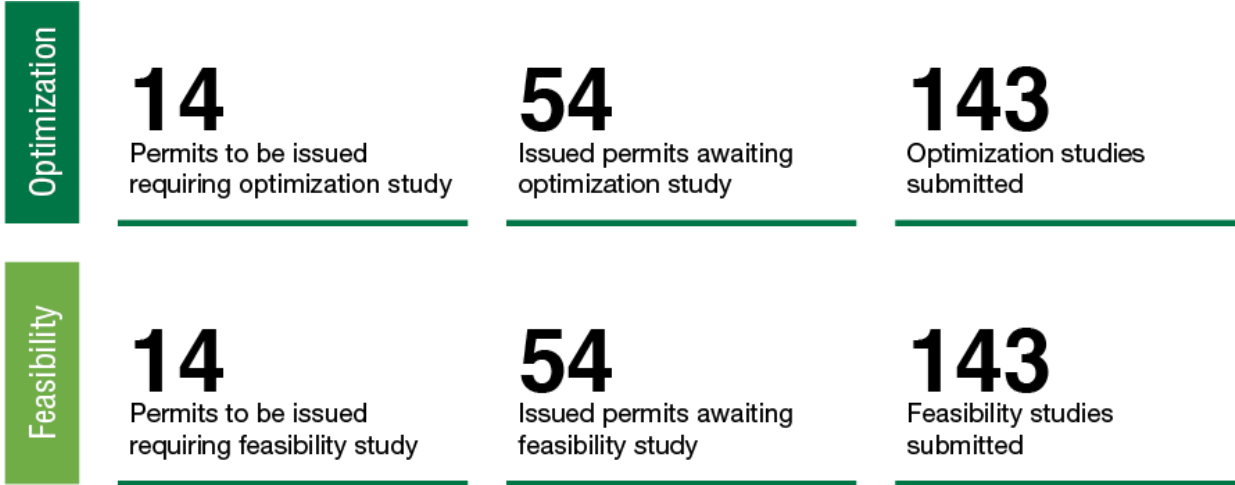


Figure 5.4. Feasibility studies and optimization studies submitted by major municipal facilities

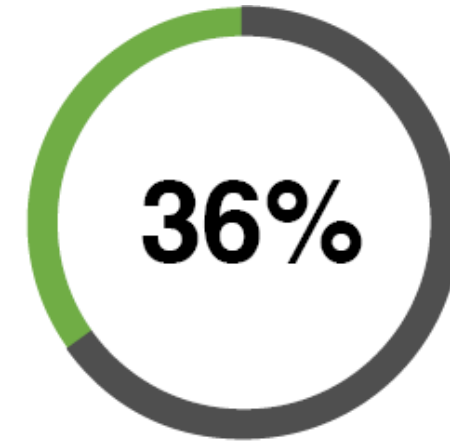


Figure 5.3. Percentage of major municipal NPDES permits with total phosphorus limits statewide
77 Facilities



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



Nutrient Assessment and Reduction Plans (NARPs)

- Illinois EPA developed an online interactive map showing the locations of facilities and their NARP status:
- <https://illinois-epa.maps.arcgis.com/home/item.html?id=dd82c86b7325412f823f623b51fe6db9>

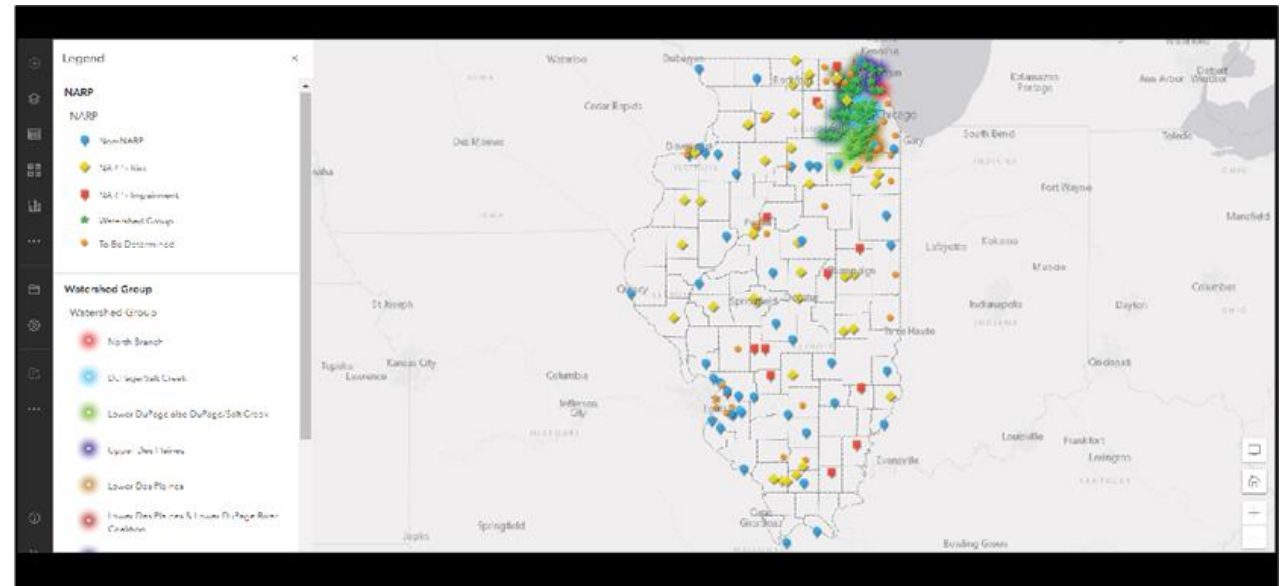


Figure 5.2. Screenshot of the NARP map website





Watershed Groups

- Multi-stakeholder watershed groups conducting watershed planning, implementation, and NARP development
- Fox River Study Group
- DuPage River Salt Creek Workgroup
- Lower Des Plaines Watershed Group
- Lower DuPage River Watershed Coalition
- North Branch Chicago River Watershed Group
- Des Plaines River Watershed Workgroup



RESTORE SALT CREEK
MODIFICATION AND HABITAT RESTORATION



**NORTH BRANCH
CHICAGO RIVER
WATERSHED
WORKGROUP**



**DES PLAINES RIVER
WATERSHED
WORKGROUP**



**ILLINOIS
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State Revolving Fund

- Illinois EPA State Revolving Fund provides low-interest loans for drinking water and wastewater upgrades
- Water Pollution Control Loan Program includes
 - Upgrades to improve nutrient removal
 - Green infrastructure
 - Urban stormwater treatment
 - Control Combined Sewer Overflows (CSO)
- Projects to reduce nutrients loads from wastewater plants
 - 2019: 12 projects = \$187,626,382
 - 2020: 1 project= \$12,650,686





Future Actions

Unsewered Communities Grant Program

- Through the Rebuild Illinois Capital Plan, Illinois EPA will be providing \$100 million in construction grants over the next five years
- Wastewater collection and treatment facilities
- More than 200 communities in Illinois have inadequate or nonexistent wastewater collection and treatment facilities.
- \$1 million in planning grants available for the next four years to assist small and disadvantaged communities to identify solutions to wastewater collection and treatment needs.



Point Source Summary

- 2019-2020 Point Source loads increased slightly from 2018 loads
- Previous issue with Stickney facility is being remedied
- Total Phosphorus limits continue to be included in permits for Major Municipal facilities
- Optimization, Feasibility, and NARP studies continue to be developed
- Significant amount of investment made in nutrient removal technologies. More will be needed.
- Expect to see long term reductions in total phosphorus from the point source sector





CHAPTER 6

STORMWATER SECTOR



Photo: Red Oak Rain Garden



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REDUCTION STRATEGY

Urban Stormwater Updates

RESOURCES



OUTREACH



Table 6.1. Resources reported by the stormwater sector

Nutrient Reduction-Related Activity	2019	2020
Grants or Loans Received	\$981,932	\$1,095,454
Grants Given	\$1,266,898	\$731,925
Funded Programs	\$2,150	\$2,328
Total	\$2,250,980	\$1,829,707

Table 6.3. Outreach activities reported by the stormwater sector

Type of Activity	Number of Events	Attendance
Field Days	26	2,535
Presentations	90	7,329
Conferences	14	2,489
Workshops	19	1,987
Total	149	14,340



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Urban Stormwater Updates

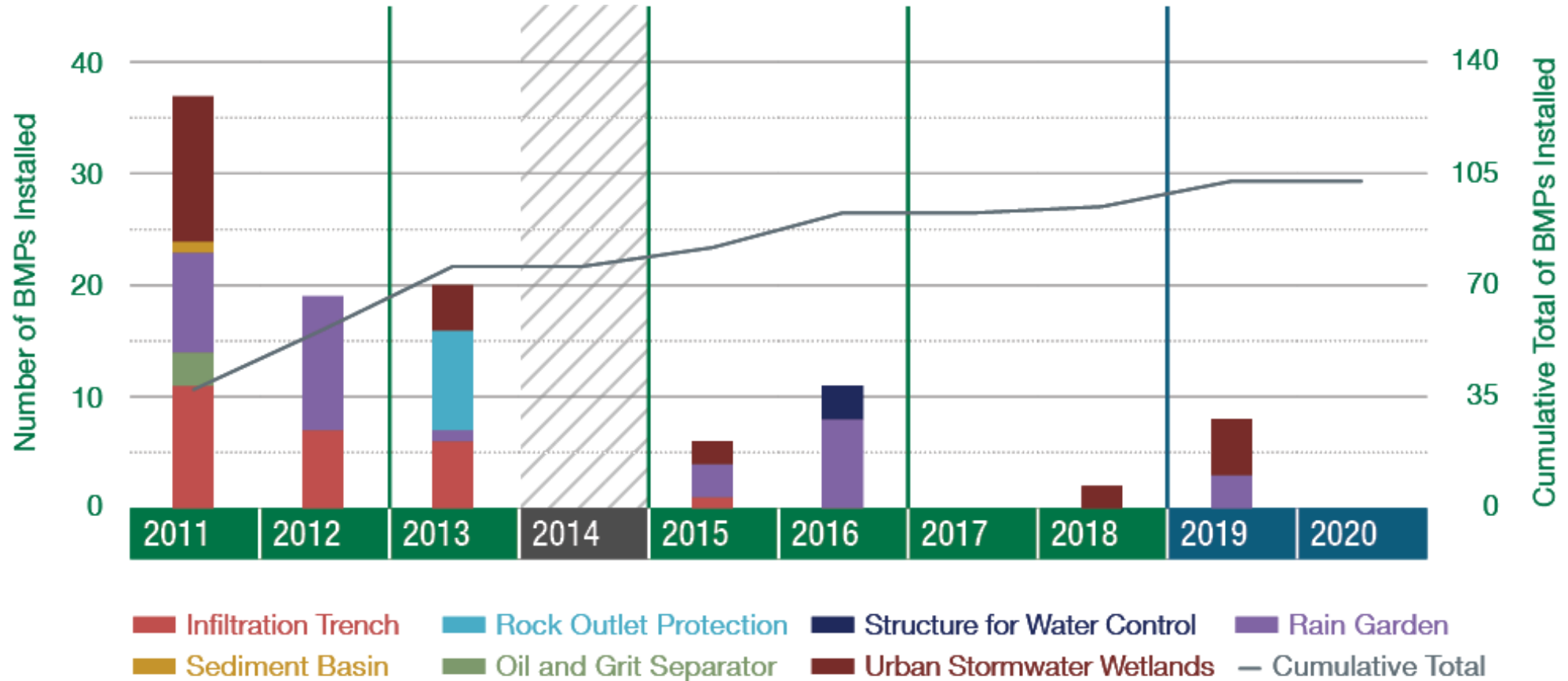


Figure 6.1. Number of urban practices installed under Section 319 grant program 2011–20



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
 - Conservation@Home
 - DuPage County programs
 - NGICP
 - Lawn to Lake
 - Rainscaping

Illinois MS4 Communities 2019 & 2020

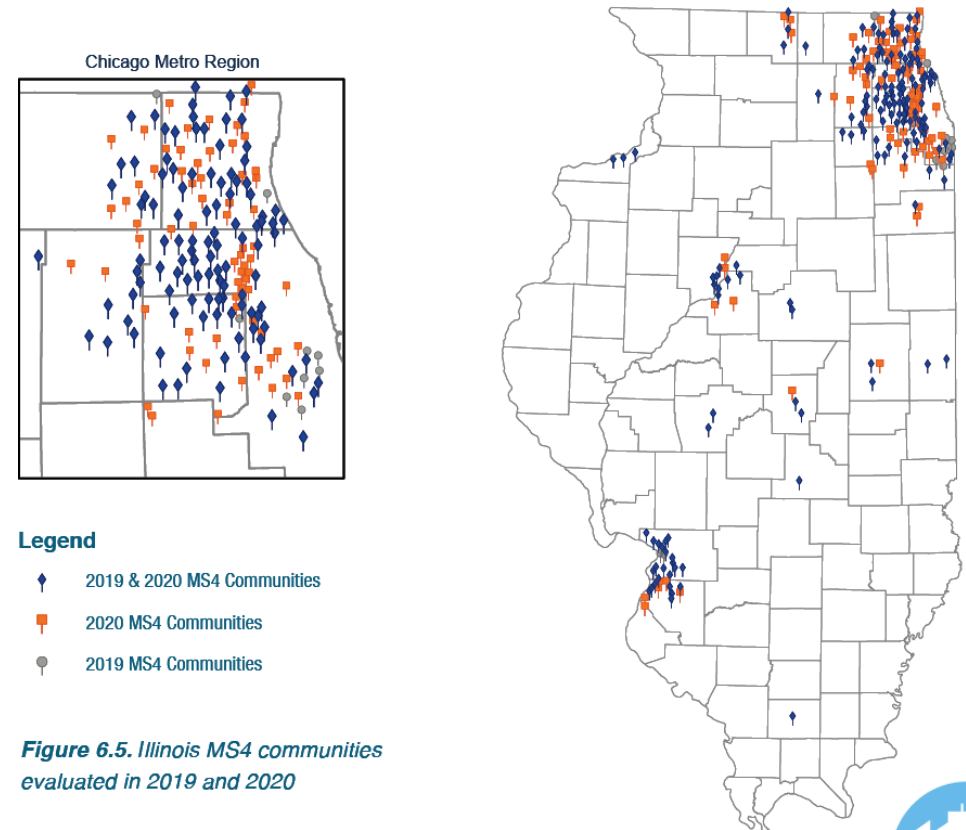


Figure 6.5. Illinois MS4 communities evaluated in 2019 and 2020





CHAPTER 8

ADAPTIVE MANAGEMENT AND MEASURING PROGRESS



Photo: Layne Knoche



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REDUCTION STRATEGY

Nutrient Loads and Water Quality Goals

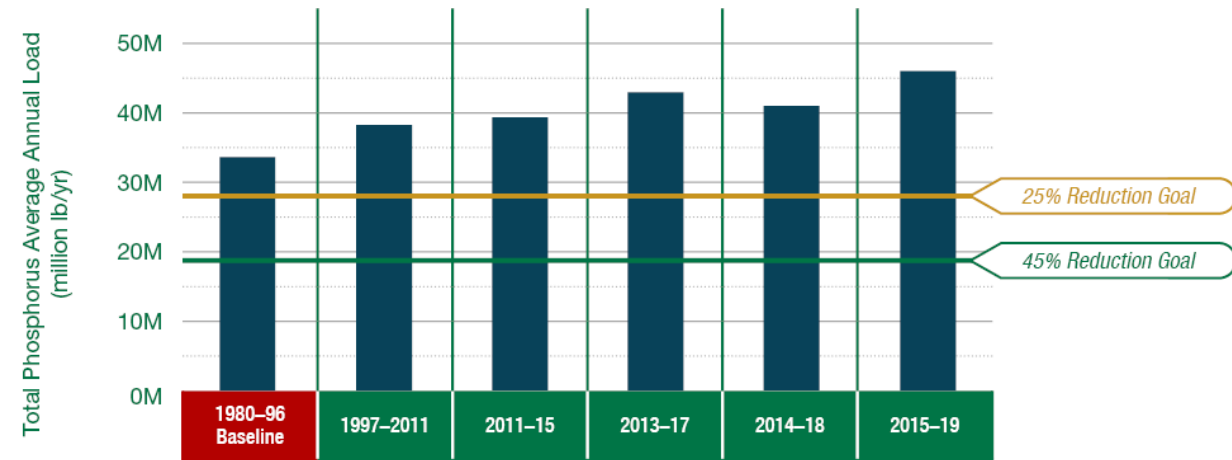
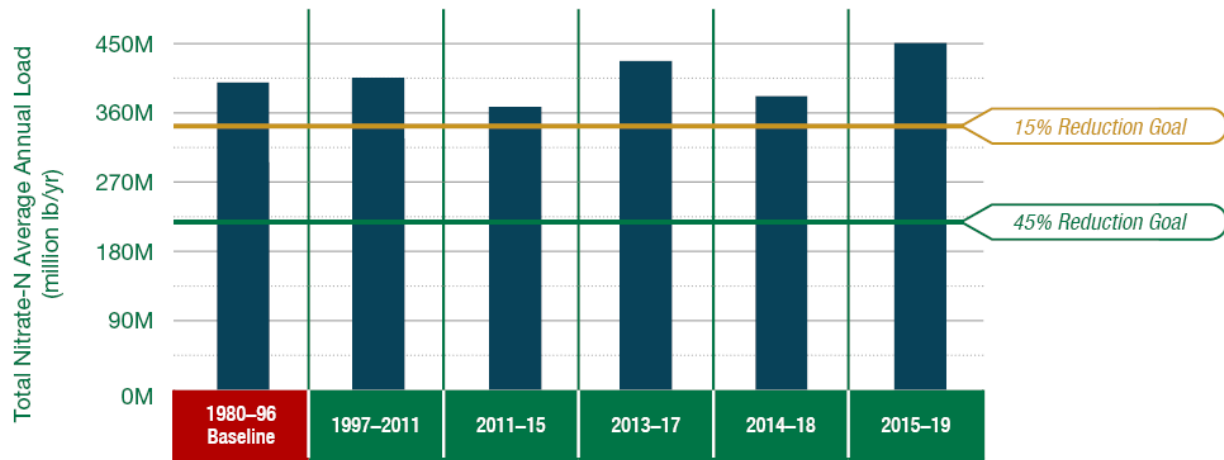


Figure 8.1. Illinois nitrate-nitrogen loads

Figure 8.2. Illinois total phosphorus loads



Implementation Scenarios

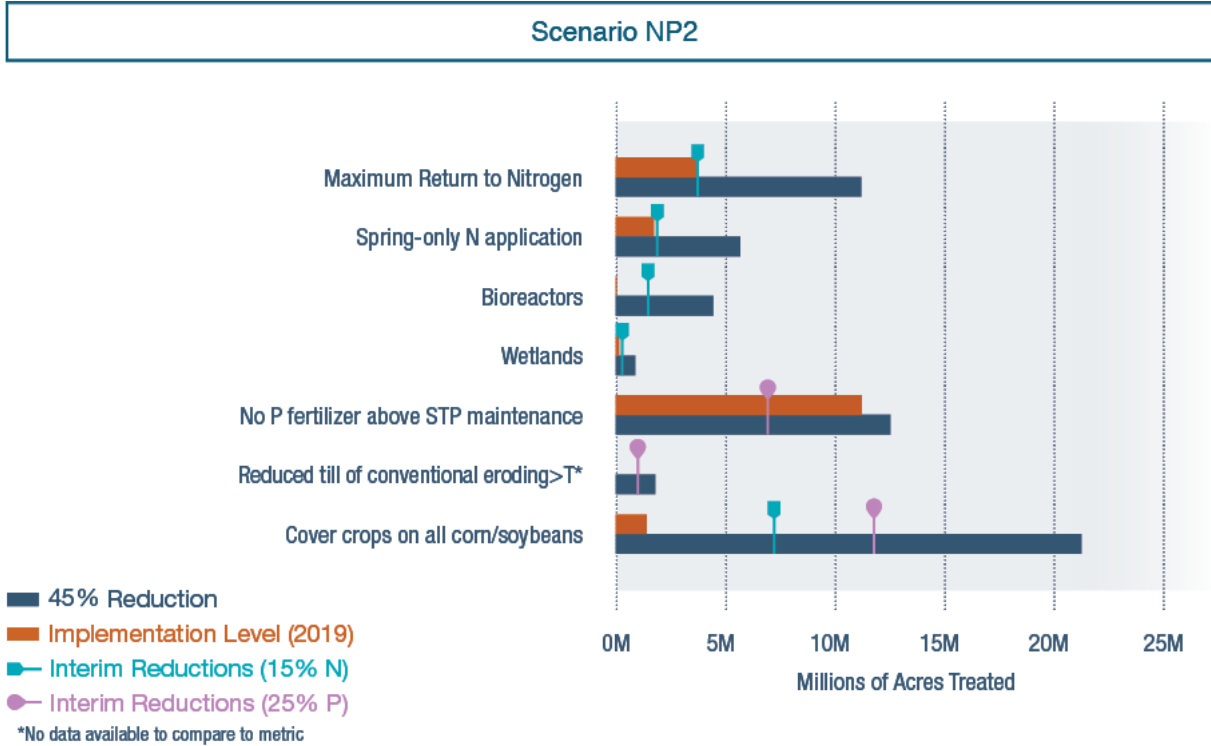


Figure 8.3. Agricultural implementation as compared with scenario NP2

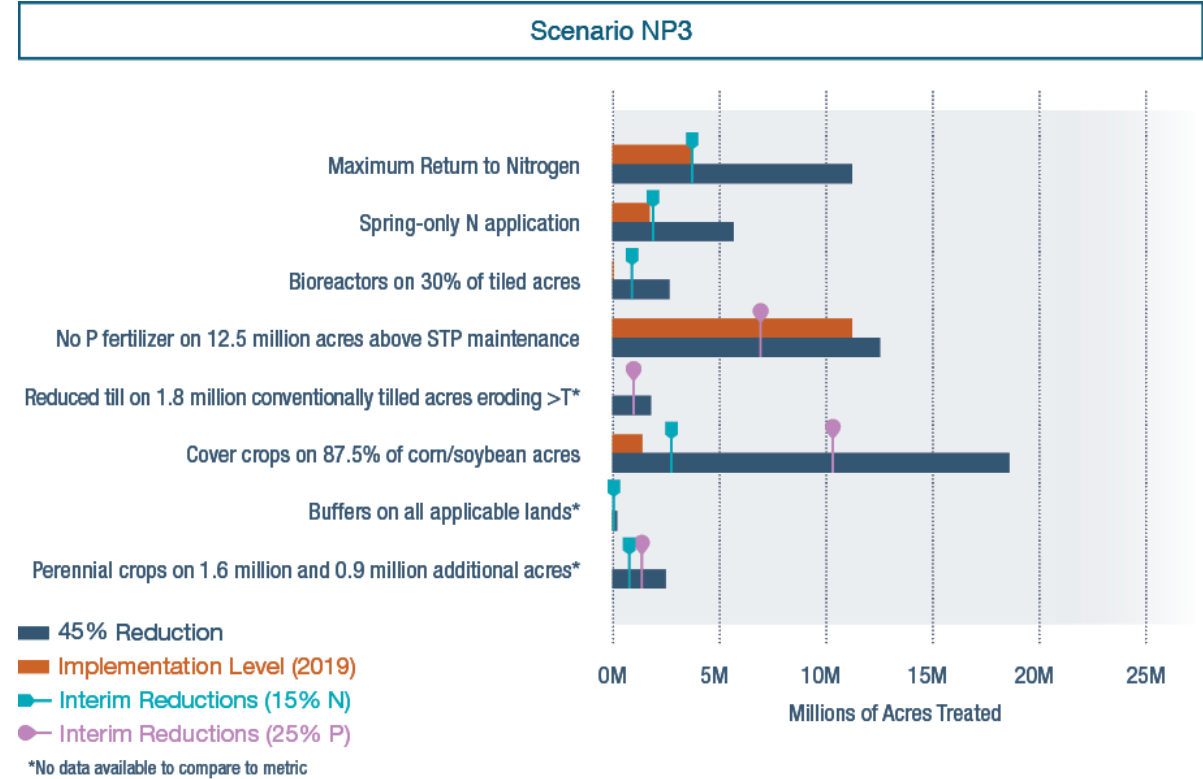


Figure 8.4. Agricultural implementation as compared with scenario NP3



Implementation Scenarios

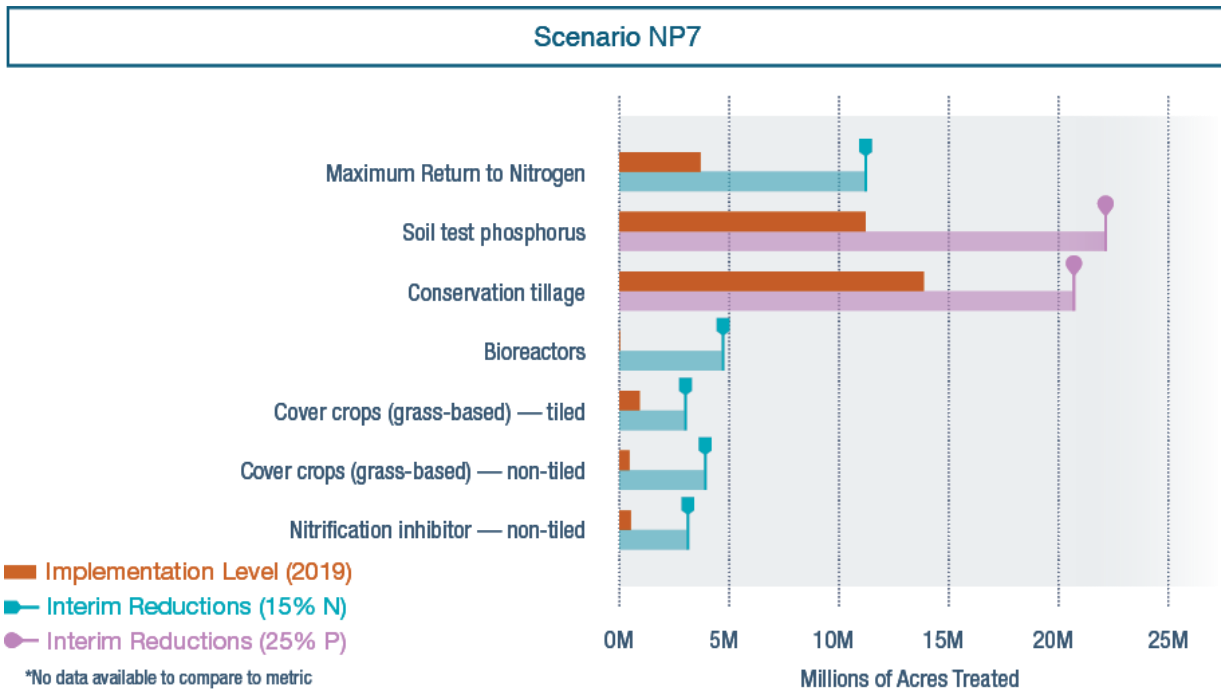


Figure 8.5. Agricultural implementation as compared with scenario NP7 (which reflects interim goals)

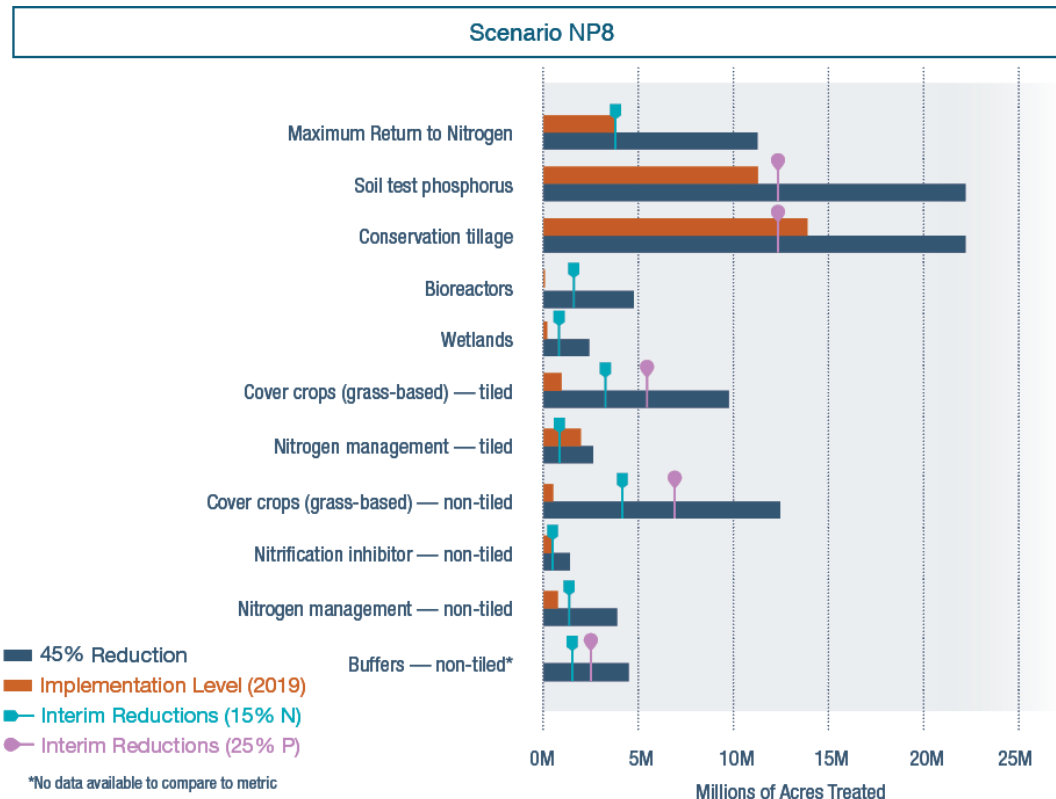
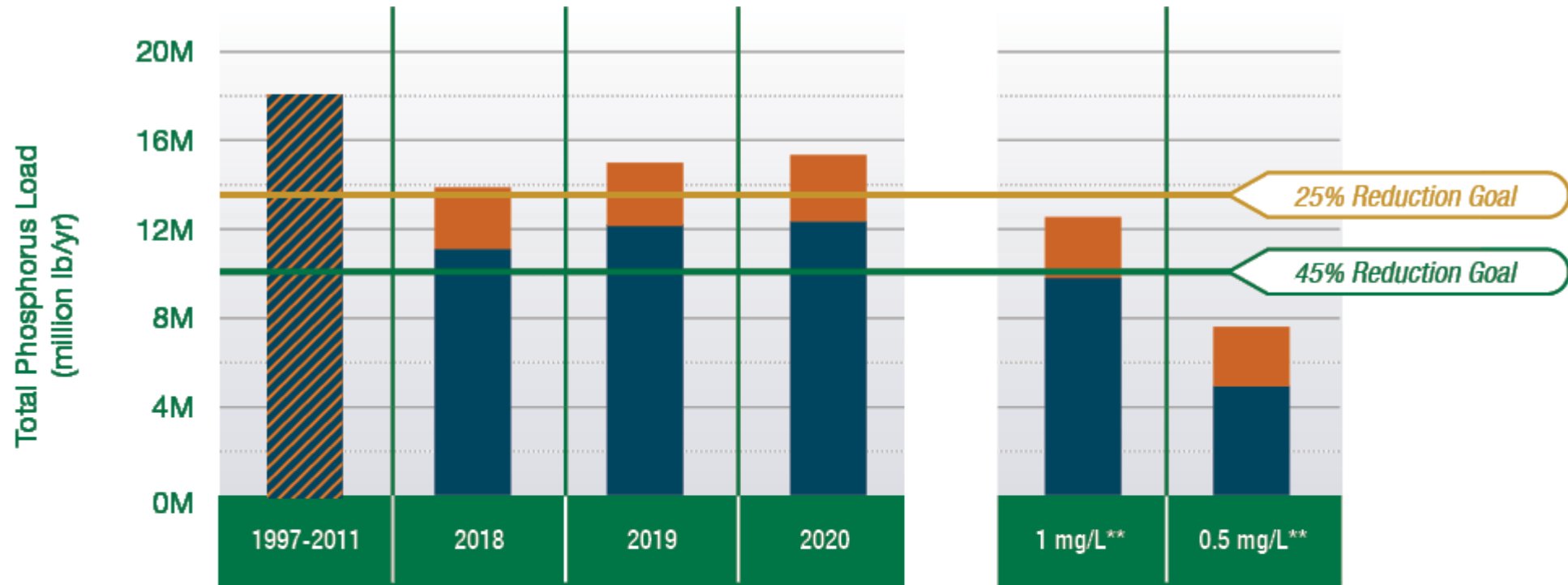


Figure 8.6. Agricultural implementation as compared with scenario NP8



Implementation Scenarios



-  All Point Source Facilities*
-  Major Municipal Facilities
-  Industrial and Minor Municipal Facilities

* Includes all point source facilities not differentiated by type or size

**Estimated future phosphorus point source load

Figure 8.7. Total phosphorus point source load



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





Contact Us

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