ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

Gulf of Mexico Hypoxia

- The Gulf of Mexico is the world's second largest hypoxic zone
- First documented in 1972
- Includes the nation's largest and most productive fishery
- Ag is the primary contributor
  - N & P

Table 2.1. Watershed milestones and targets. (INLRS)

Nutrient	Phase 1 Milestones	Target
Nitrate-Nitrogen	15% by 2025	45%
Total phosphorus	25% by 2025	45%

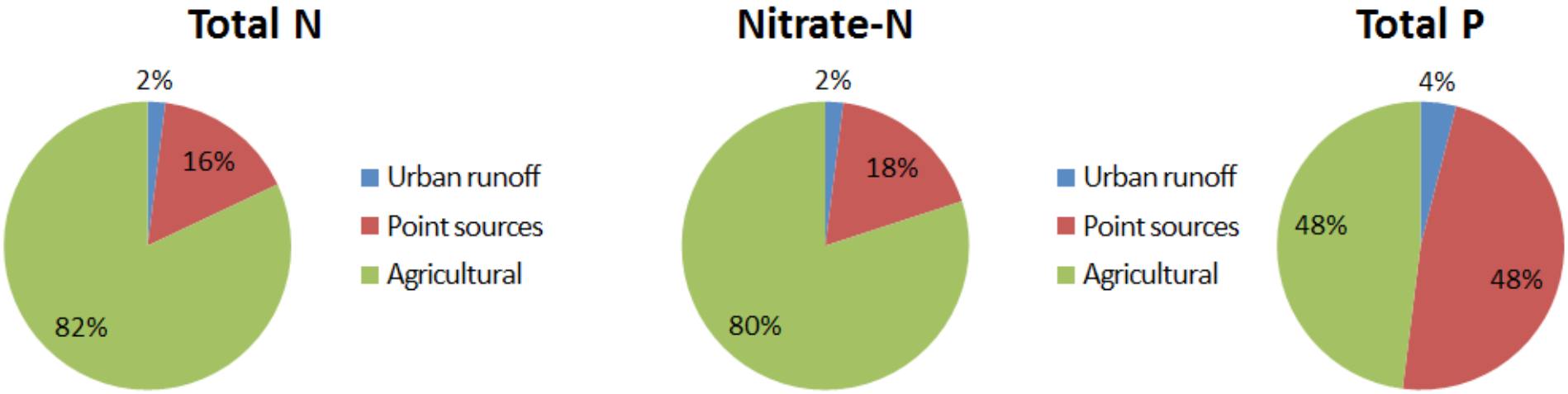
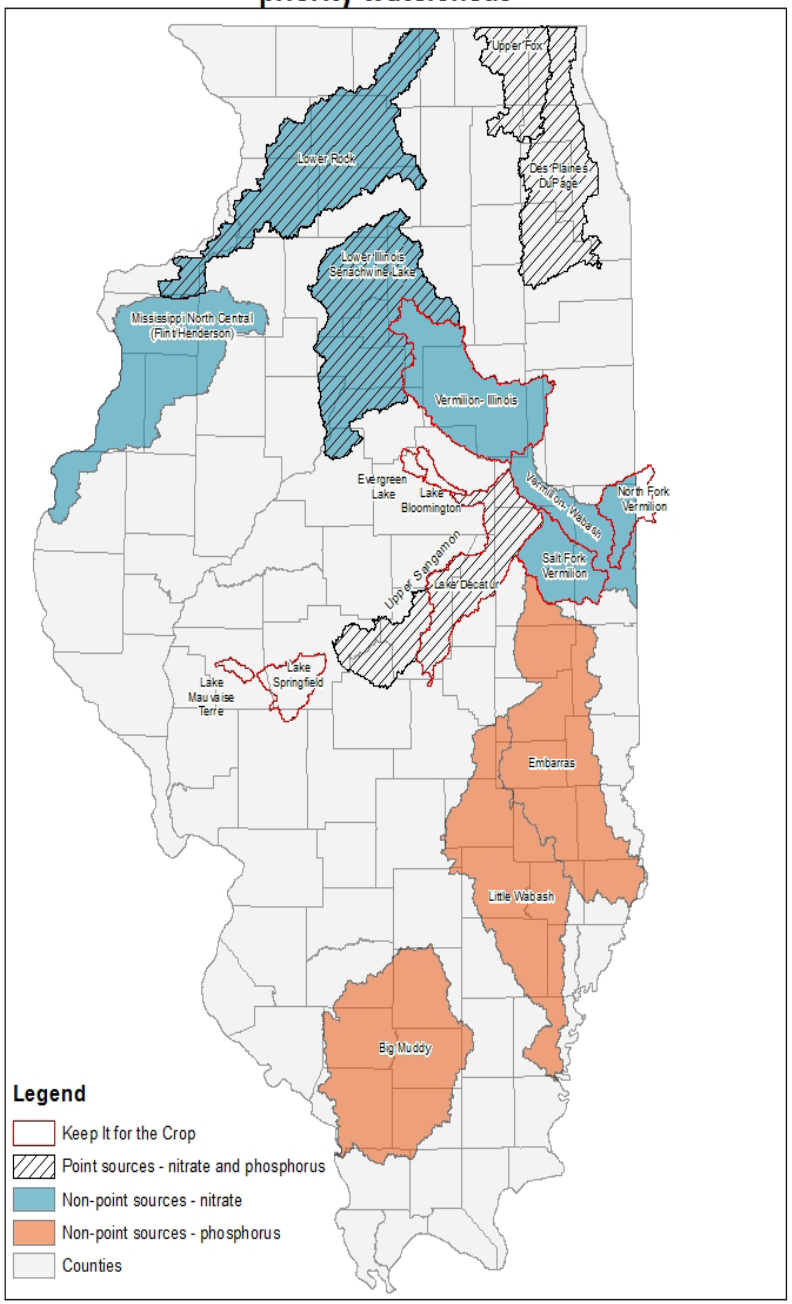
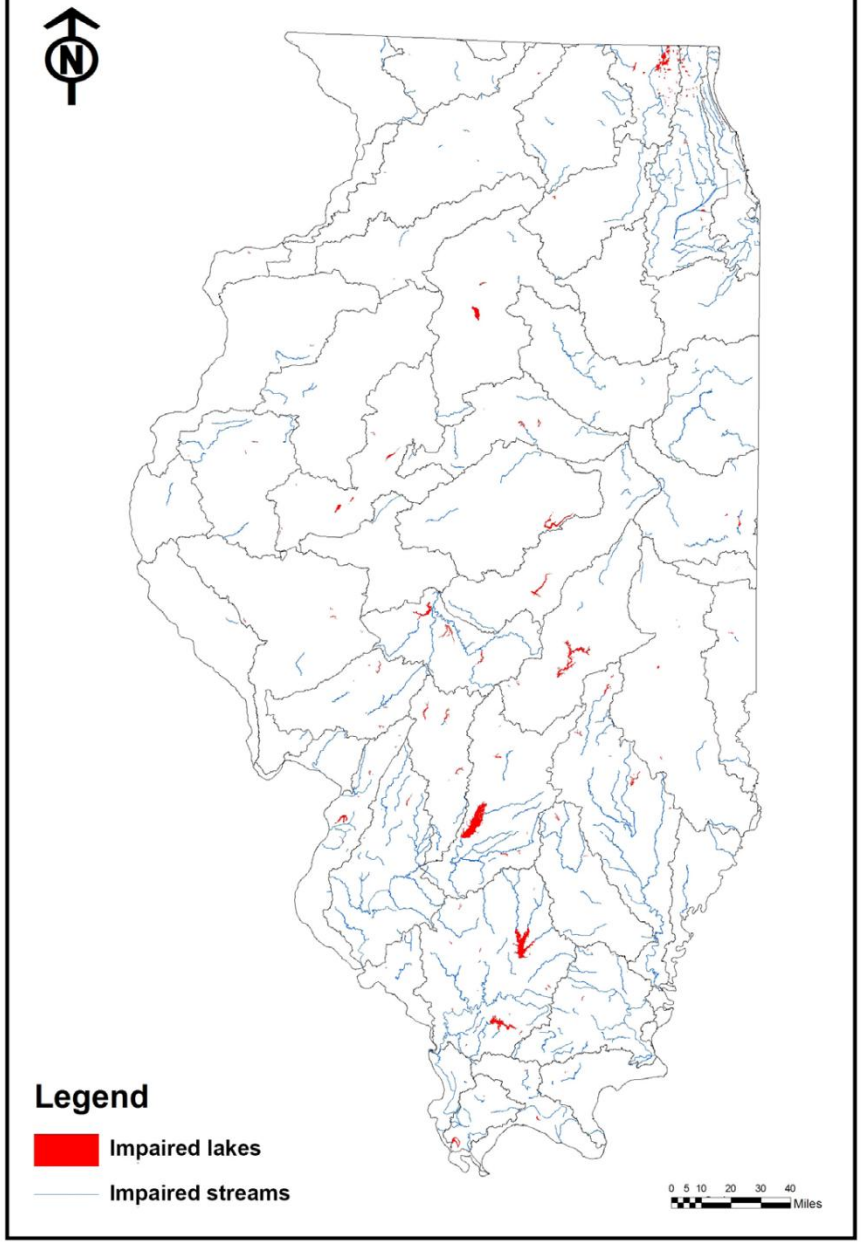


Figure 2.1. The proportion of nitrate and total phosphorus lost to the Mississippi River by source. (INLRS)

Illinois Nutrient Loss Reduction Strategy priority watersheds



Illinois impaired streams and lakes



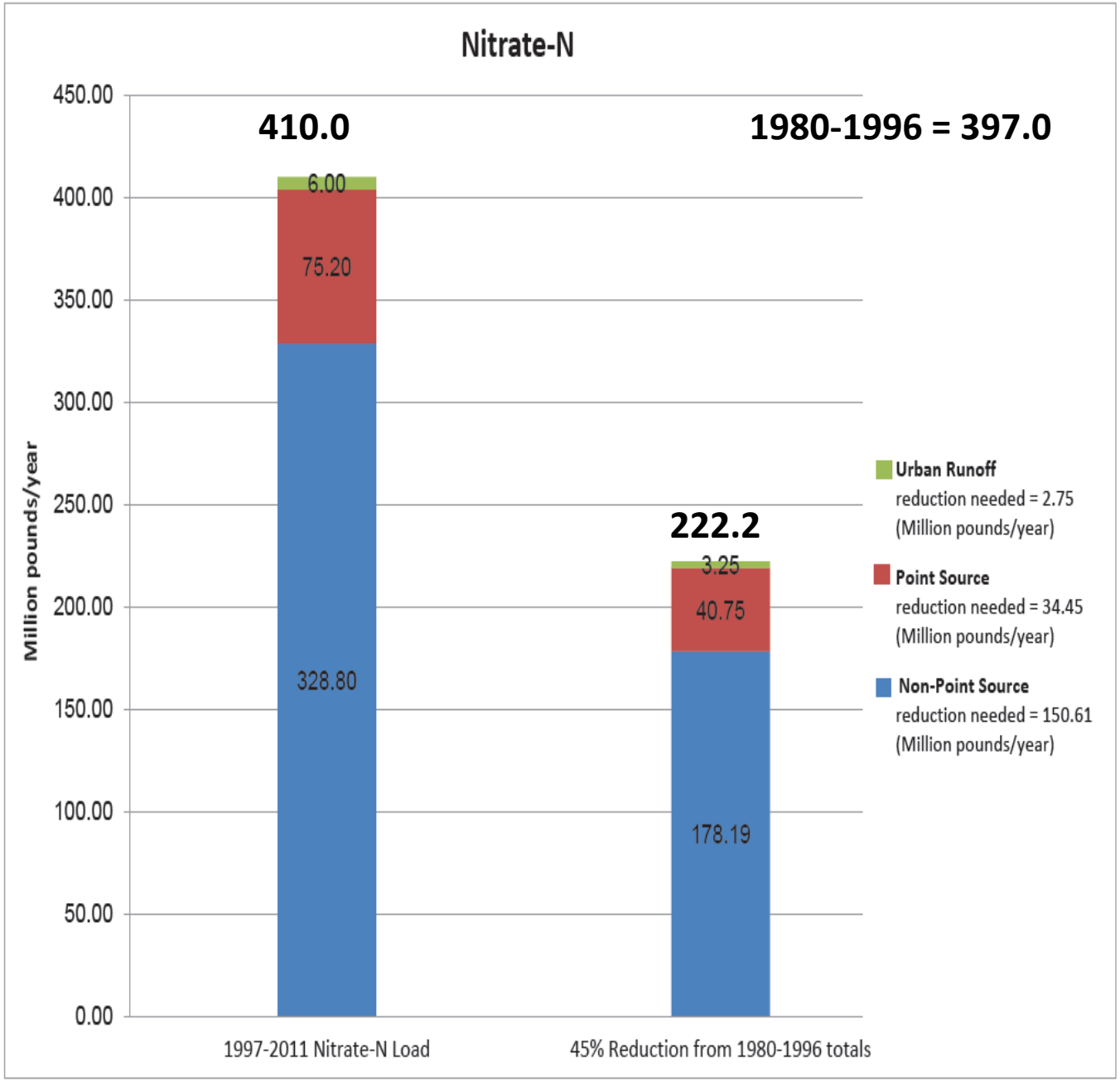


Figure 2.2. Nitrate-N reduction goal in pounds per year by source.

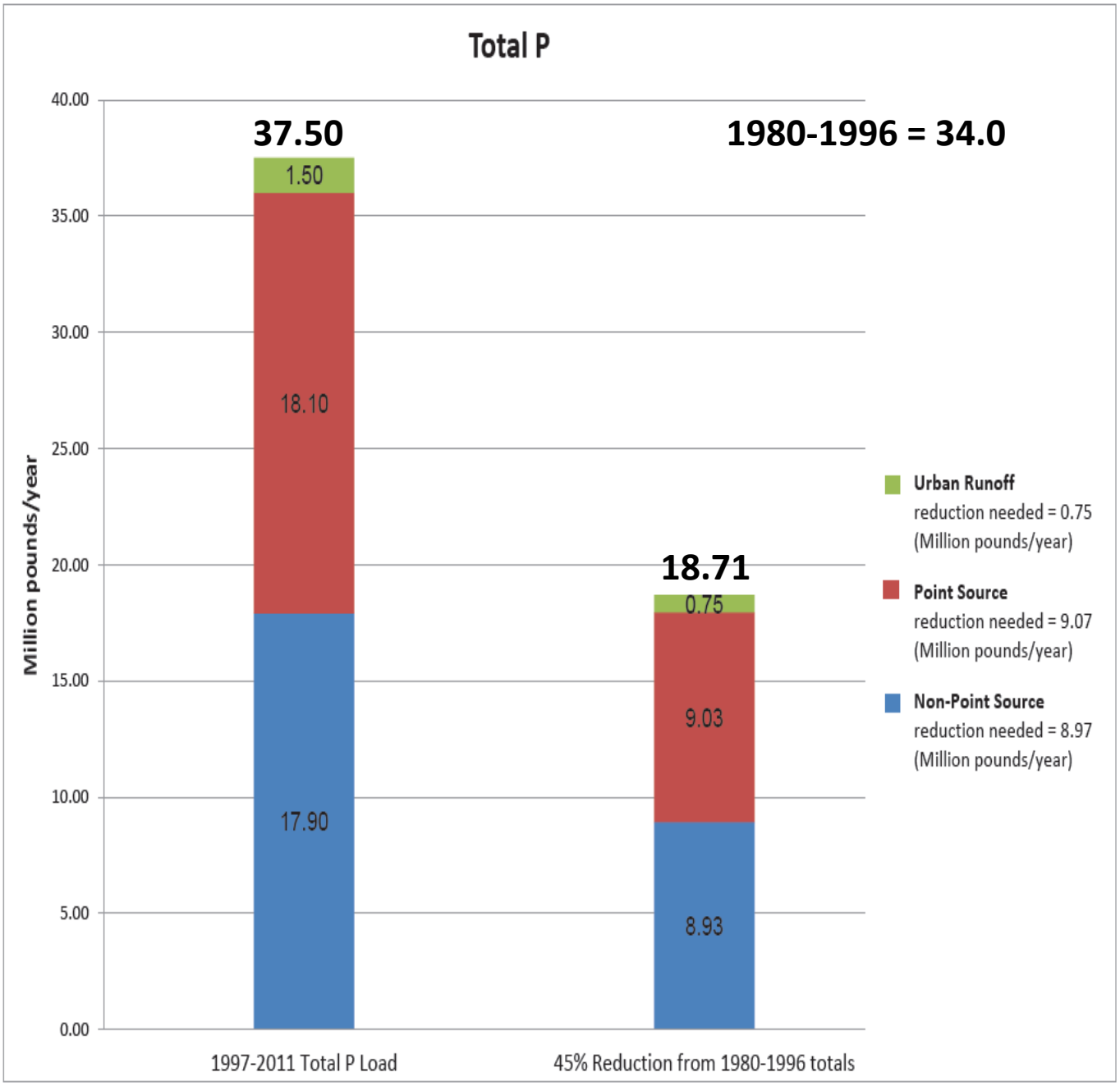
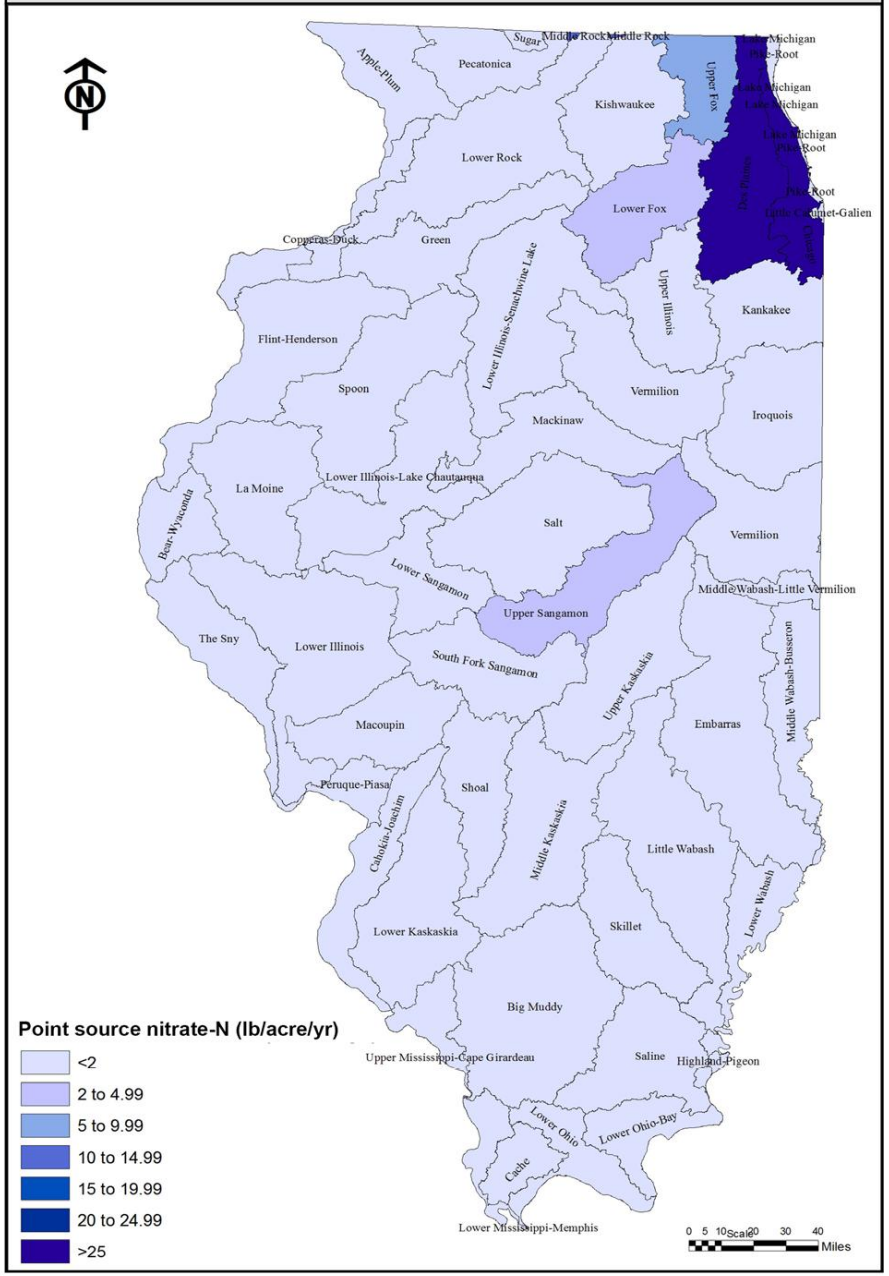


Figure 2.3. Total phosphorus reduction goal in pounds per year by source.

HUC8 point source nitrate-N yield



2017 point source TN loads by HUC8

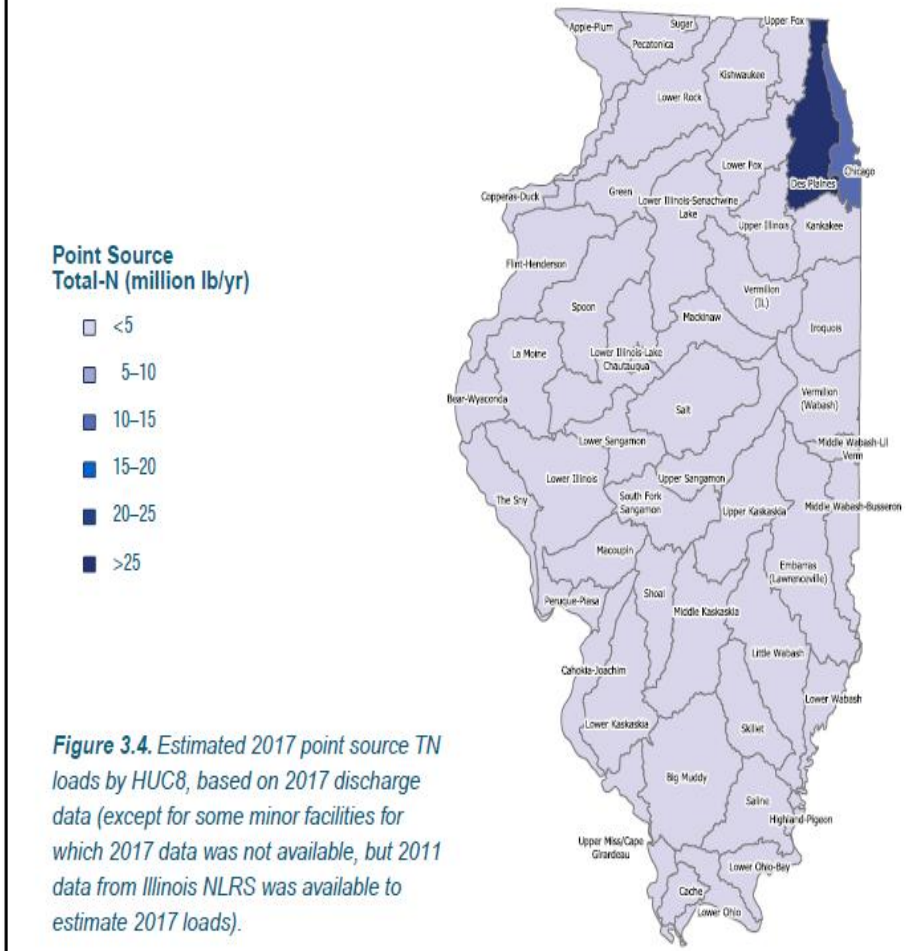
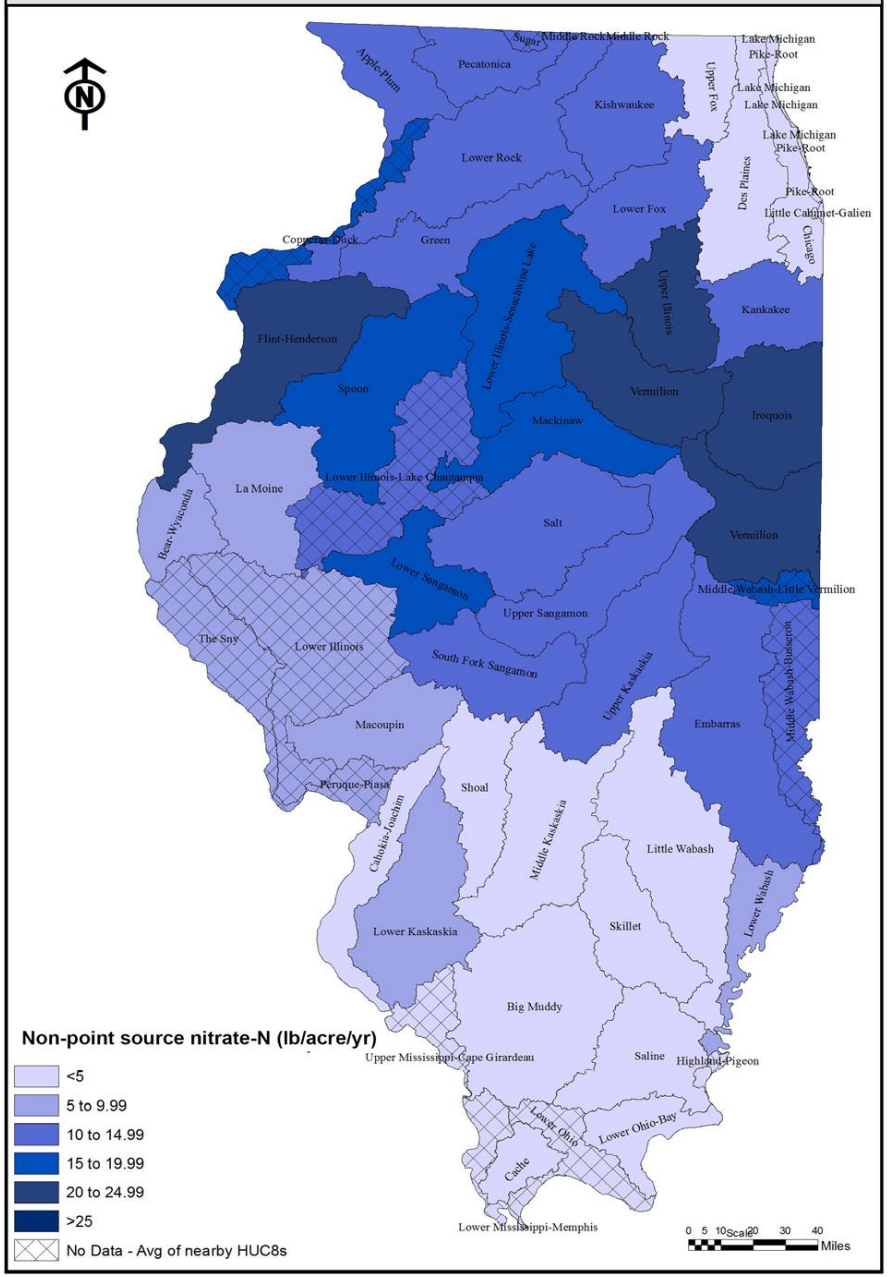


Figure 3.4. *Estimated 2017 point source TN loads by HUC8, based on 2017 discharge data (except for some minor facilities for which 2017 data was not available, but 2011 data from Illinois NLRS was available to estimate 2017 loads).*

HUC8 non-point source nitrate-N yield



Estimated annual average 2012–17 non-point source nitrate-N loads

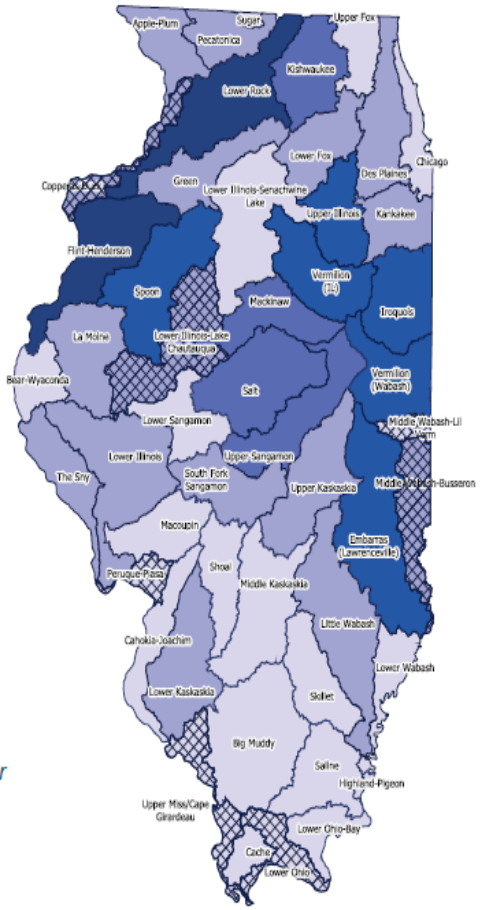
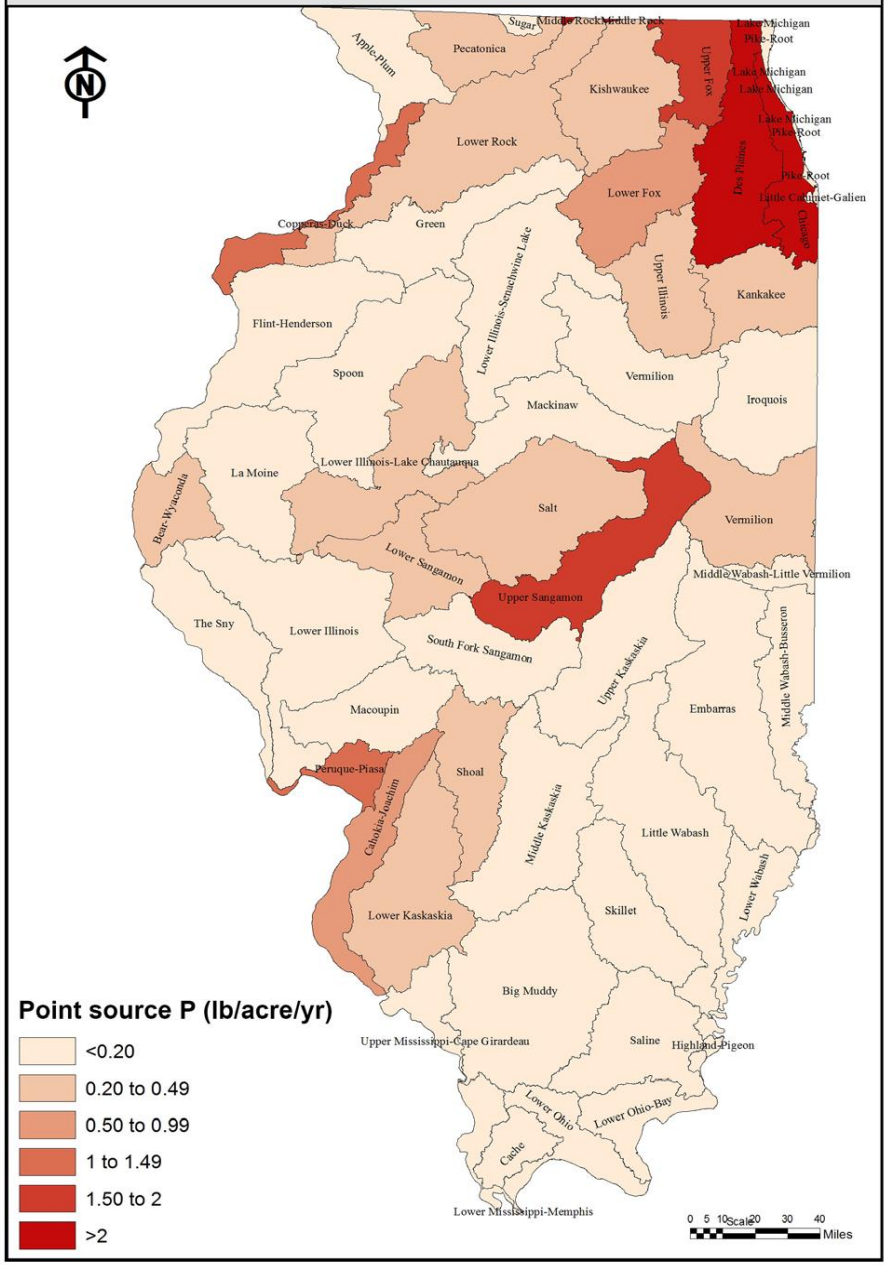


Figure 3.2. *Estimated annual average 2012–17 non-point source nitrate-N loads for HUC8s using point source locations relative to monitoring locations.*

HUC8 point source P yield



Point source TP loads by HUC8

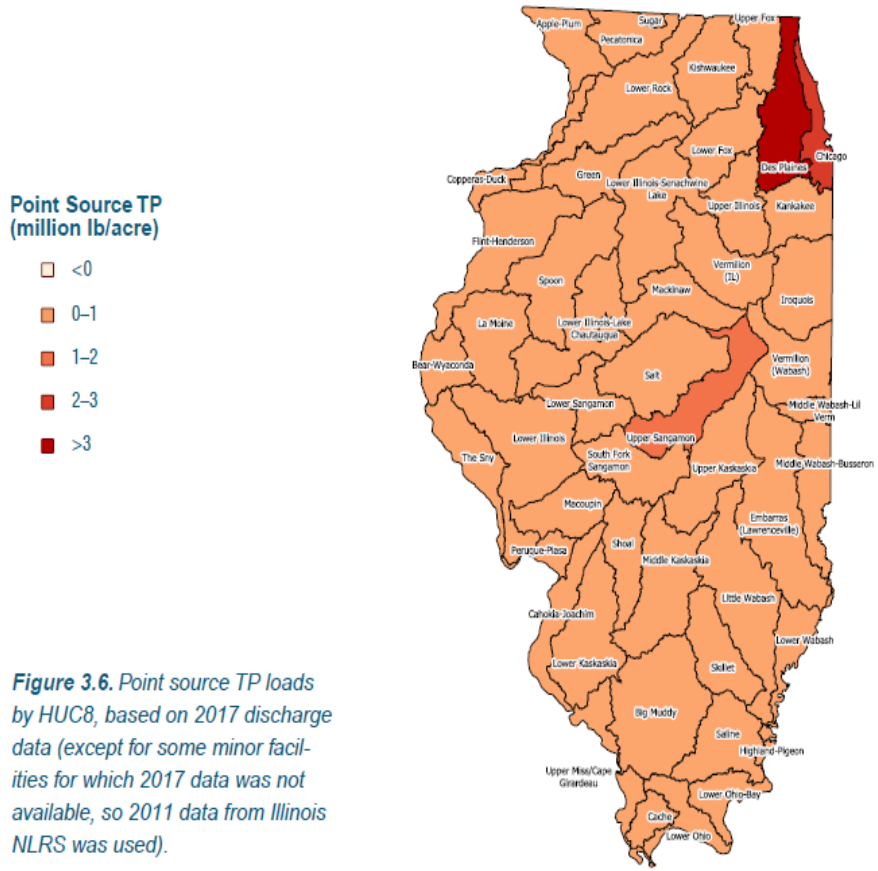
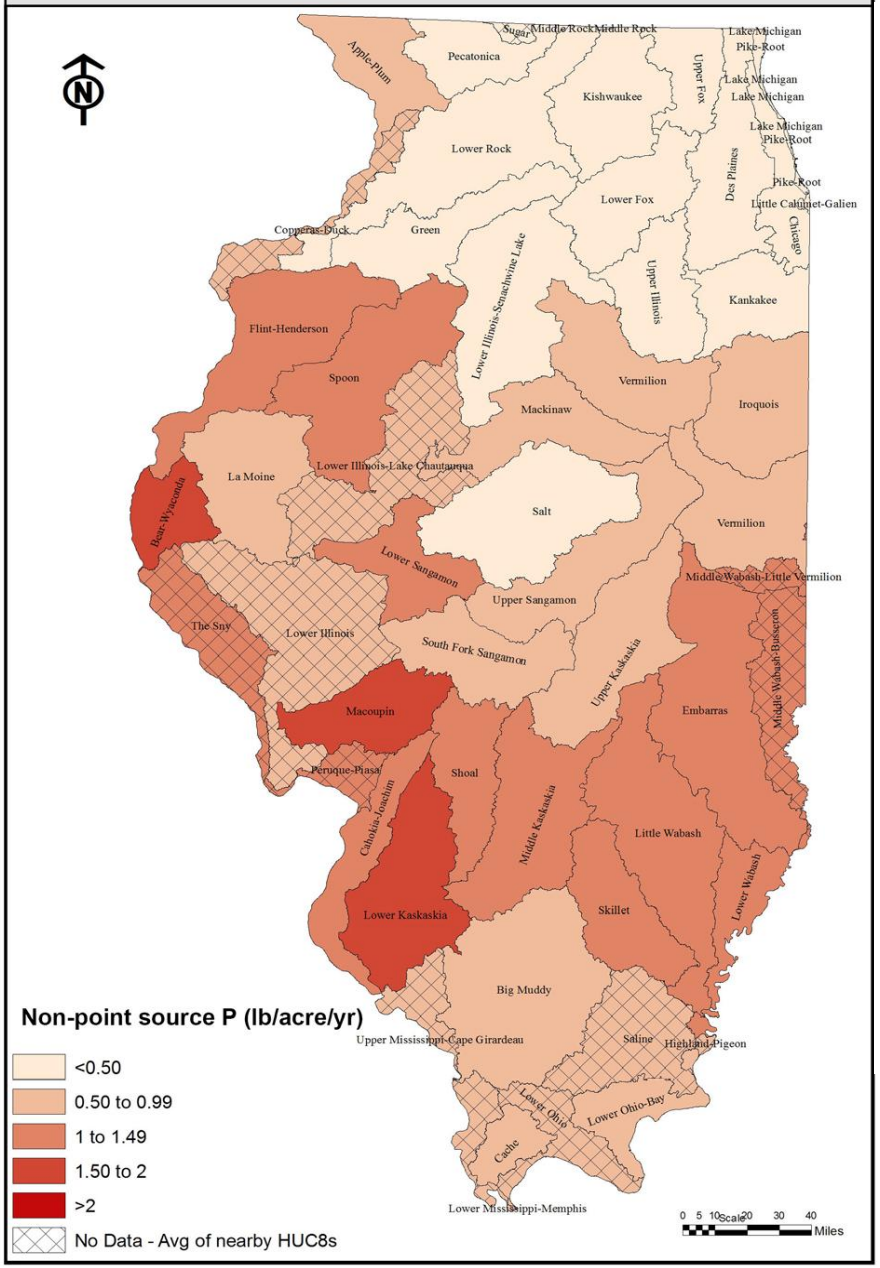


Figure 3.6. *Point source TP loads by HUC8, based on 2017 discharge data (except for some minor facilities for which 2017 data was not available, so 2011 data from Illinois NLRS was used).*

HUC8 non-point source P yield



Estimated annual average 2012–17 non-point source TP loads

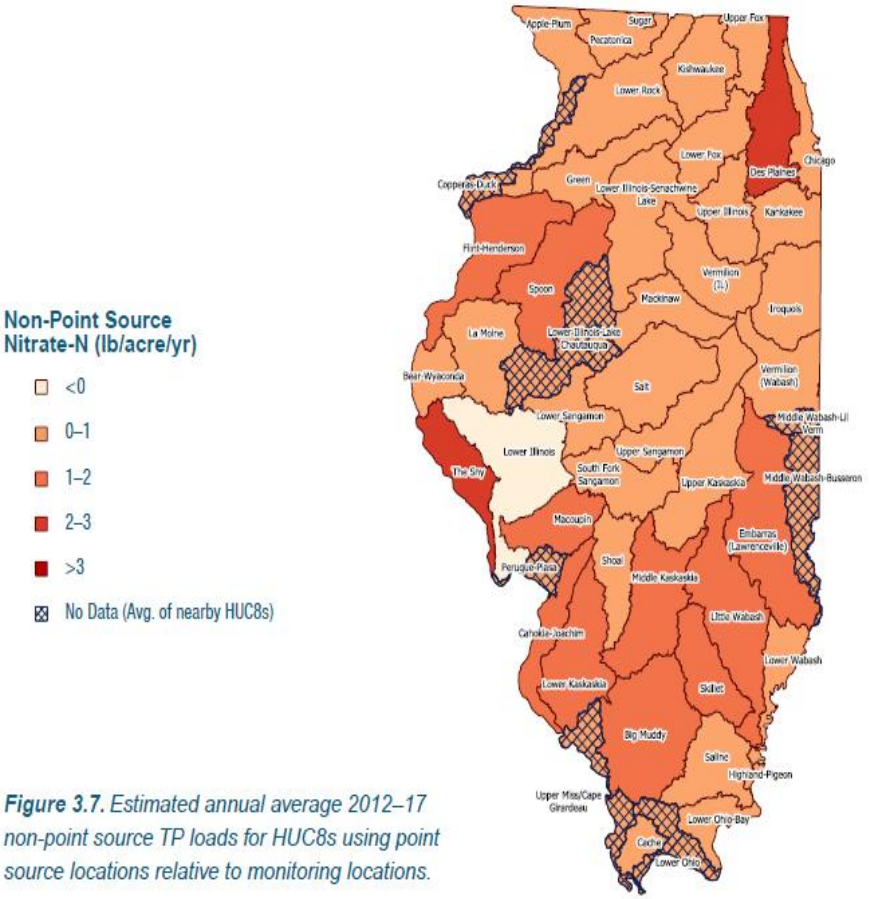


Figure 3.7. *Estimated annual average 2012–17 non-point source TP loads for HUC8s using point source locations relative to monitoring locations.*

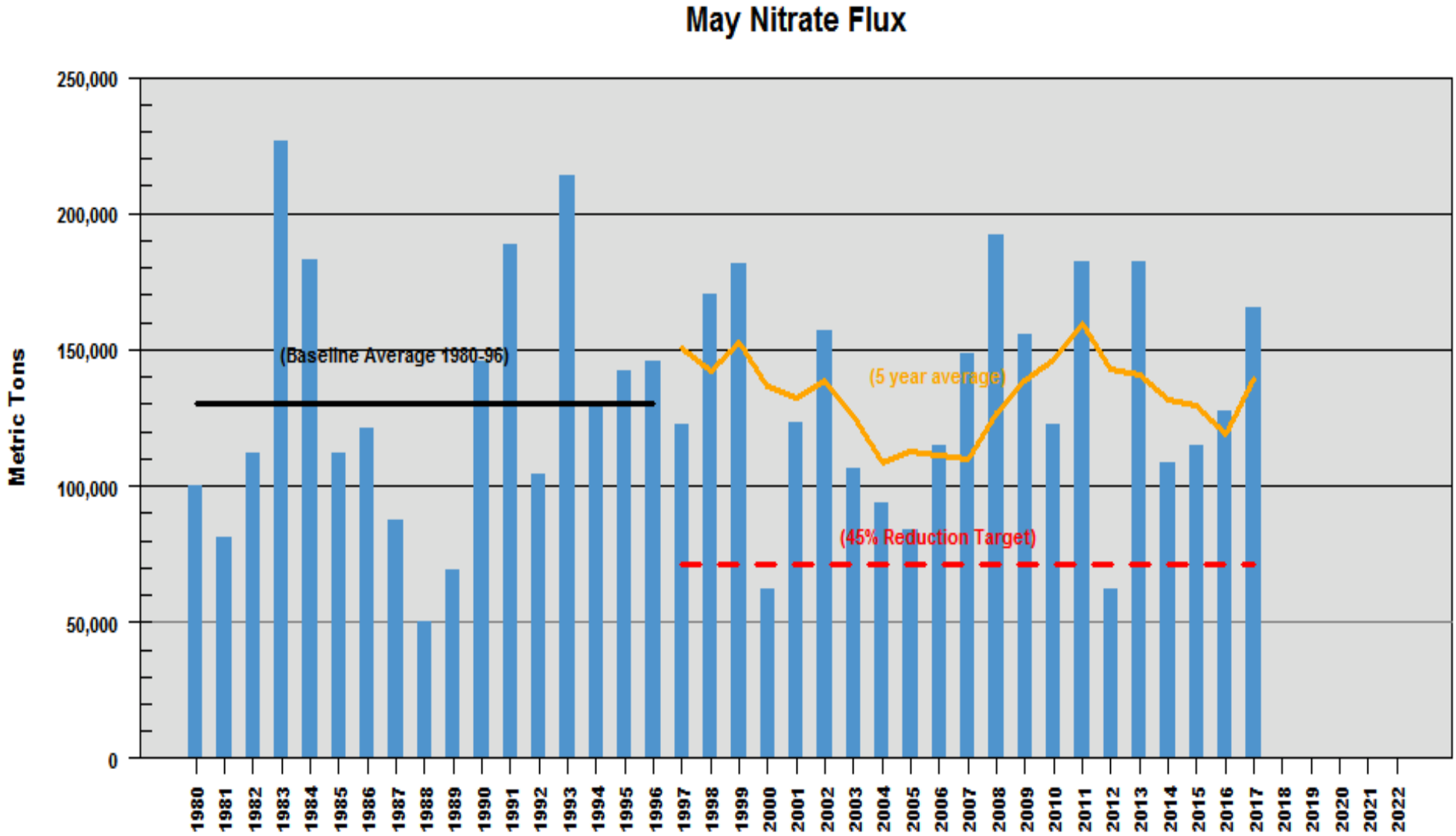
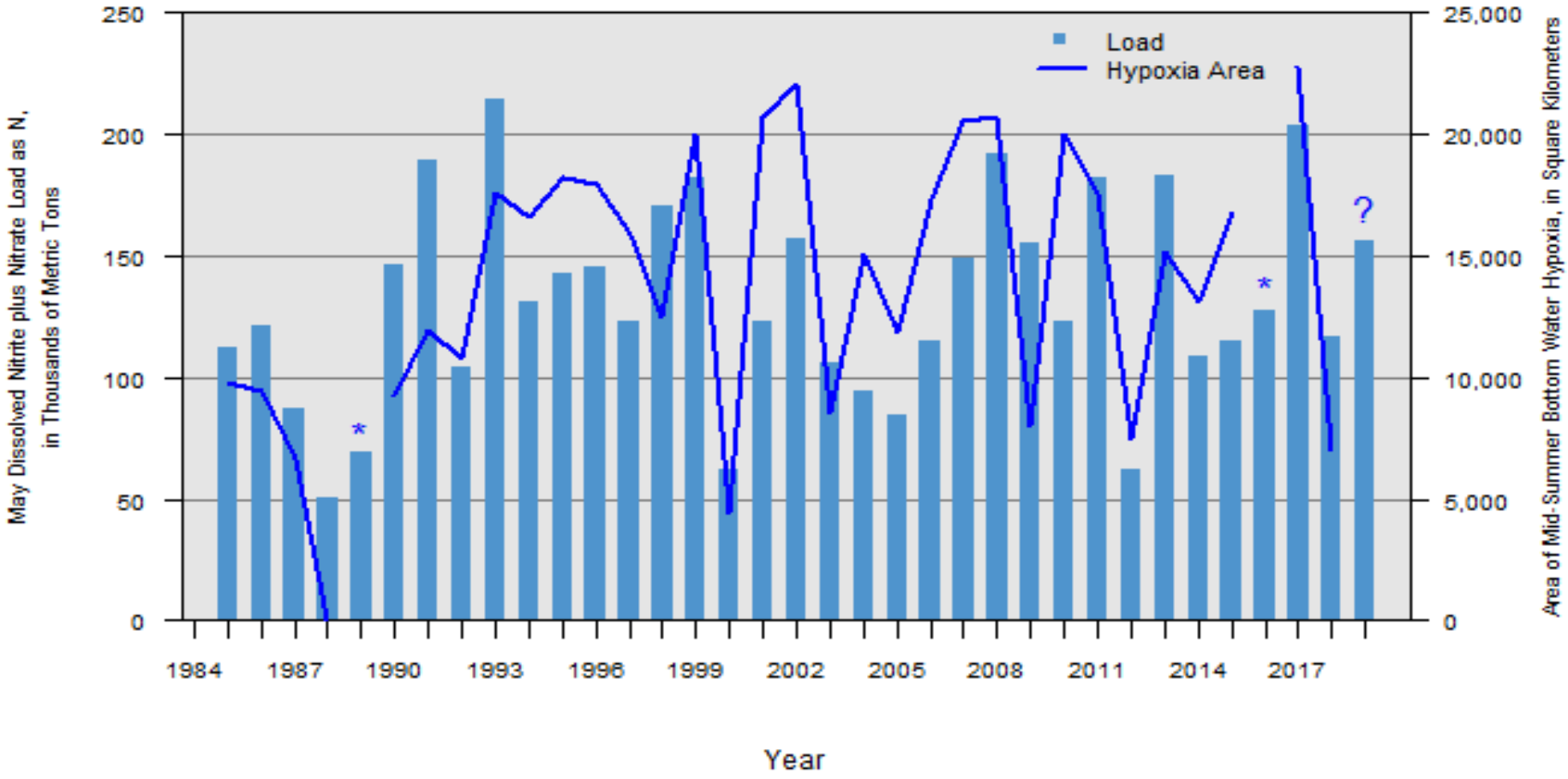


Figure 1. Estimated May dissolved nitrite plus nitrate flux to the Gulf of Mexico from 1980 to 2017.

USGS

2017 Preliminary Mississippi-Atchafalaya River Basin Flux Estimate

USGS science for a changing world



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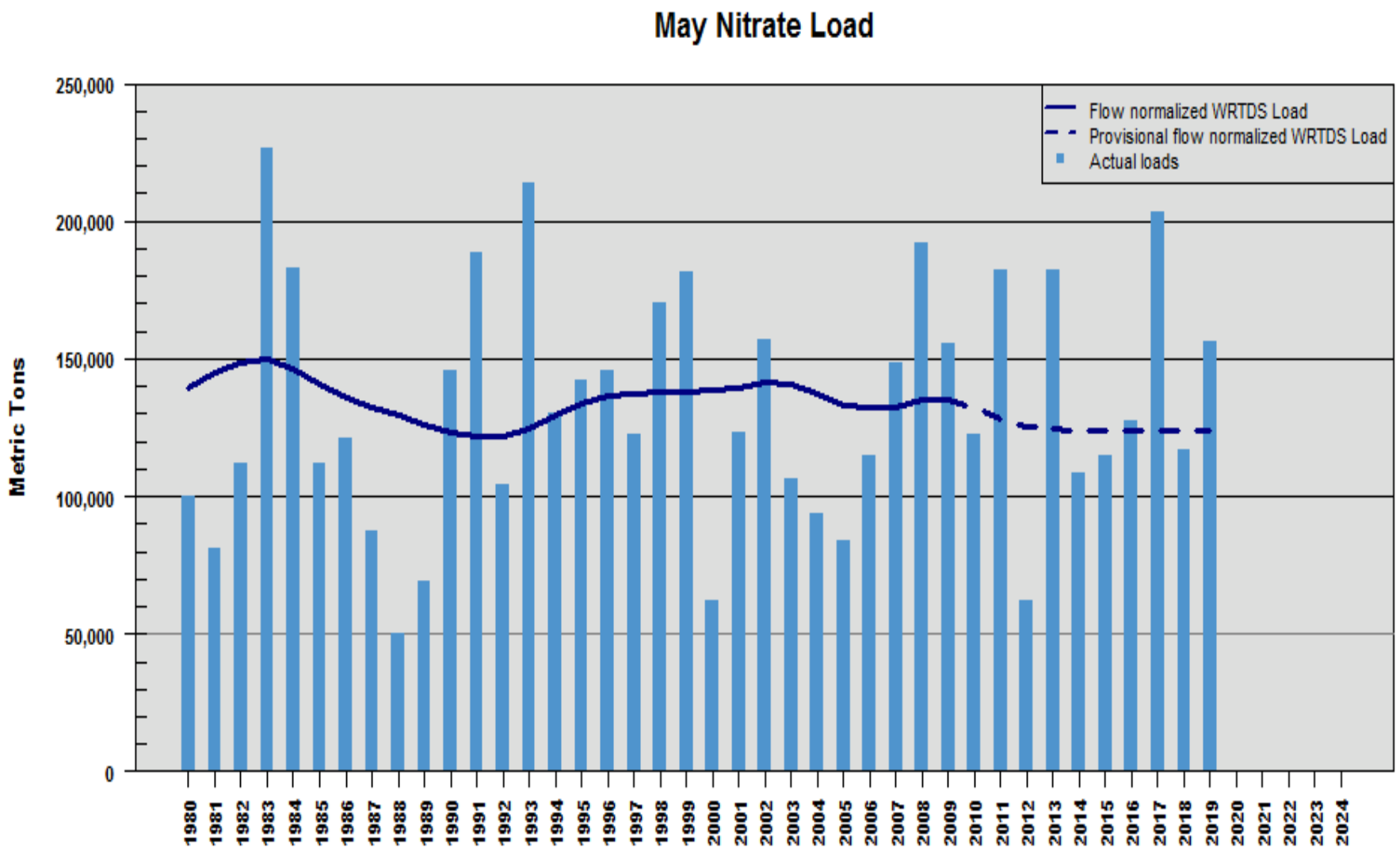

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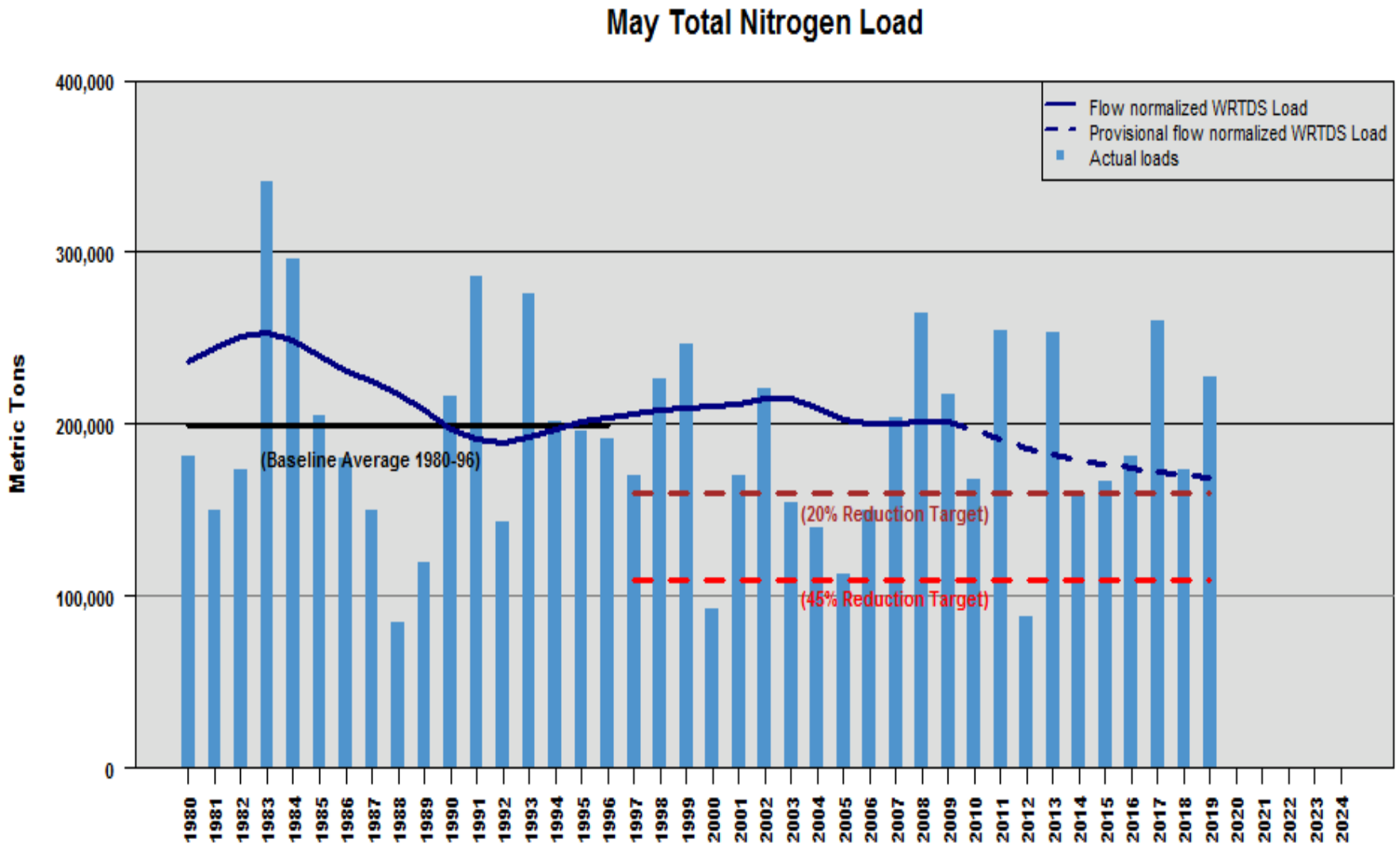

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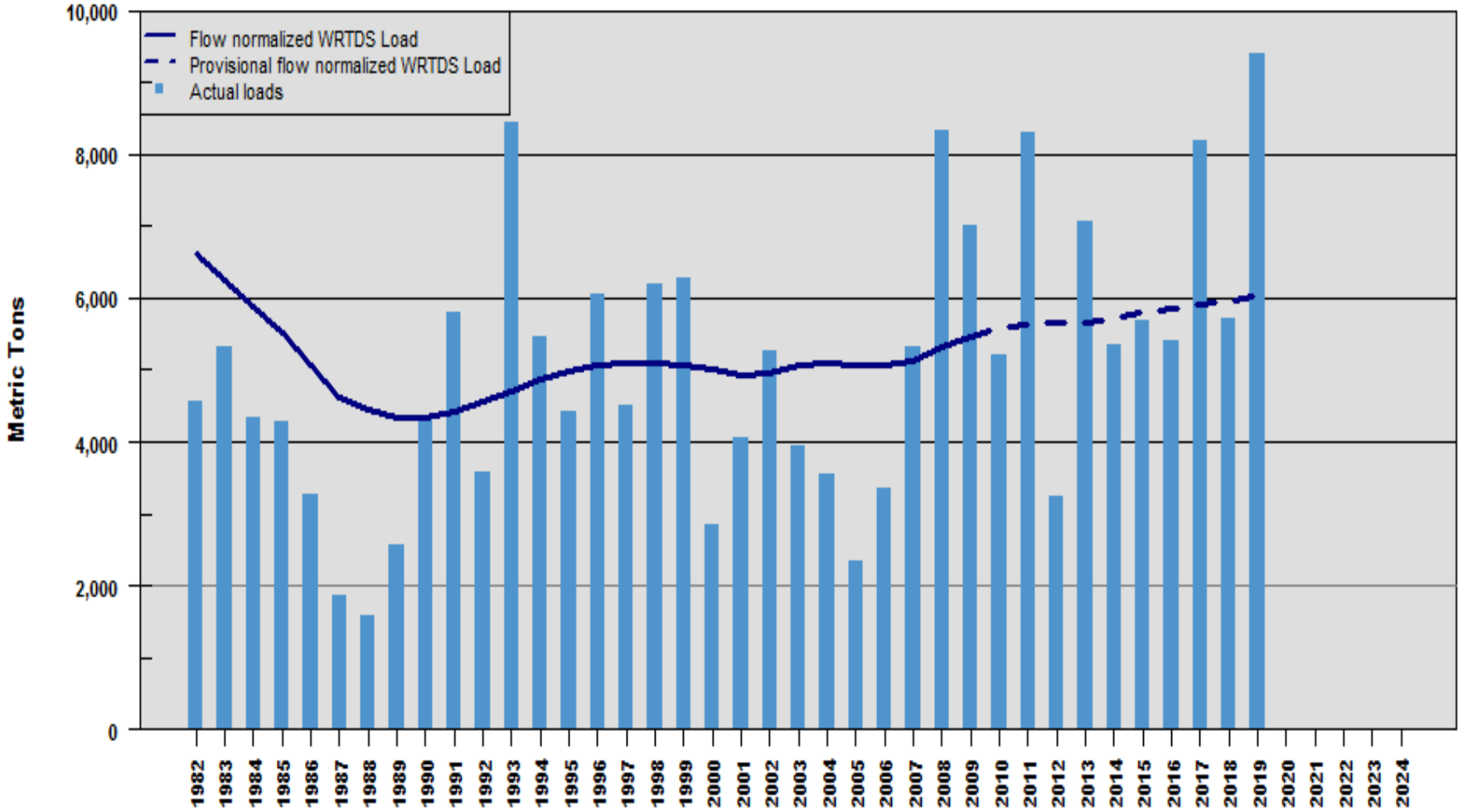
May Orthophosphate Load



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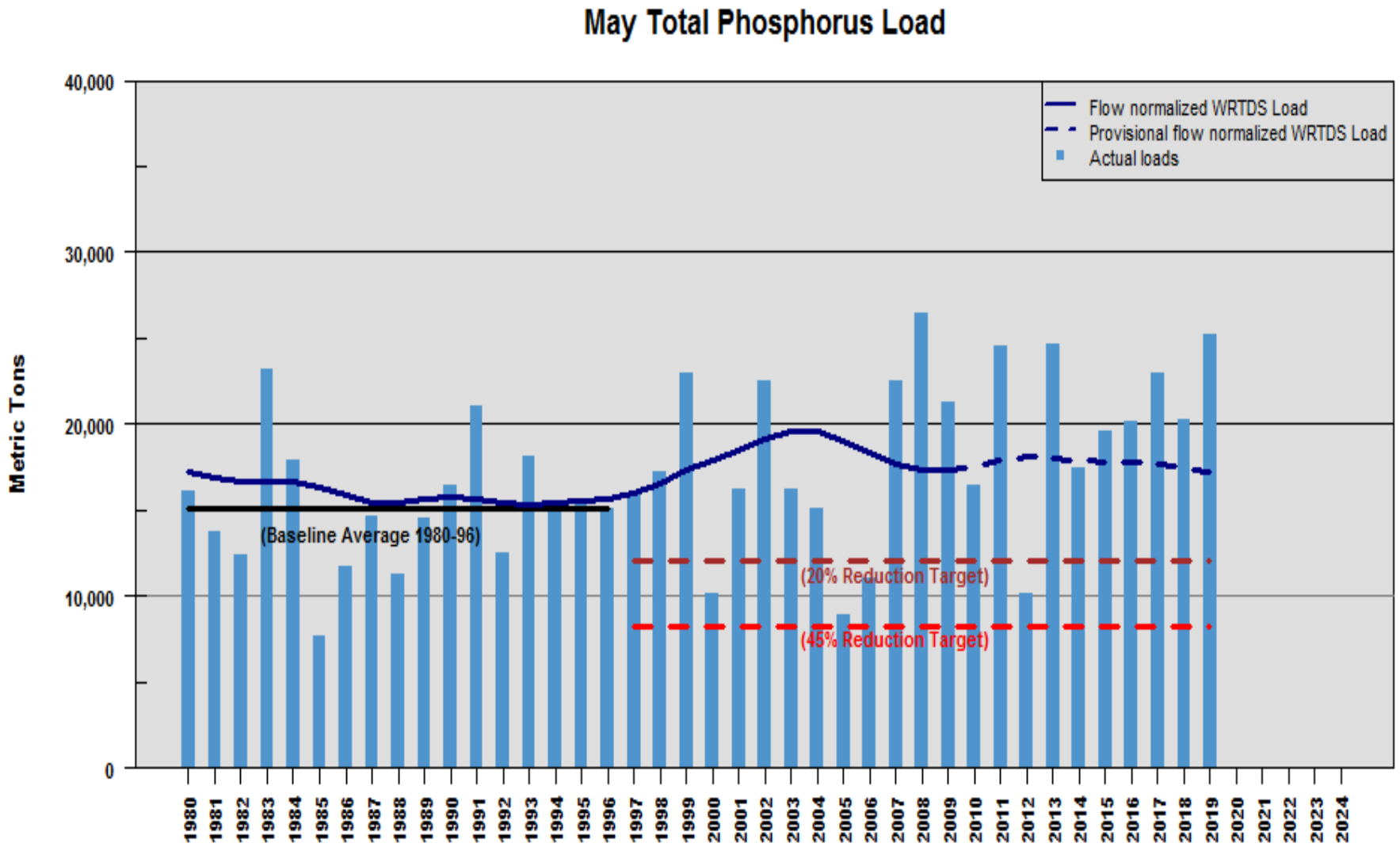

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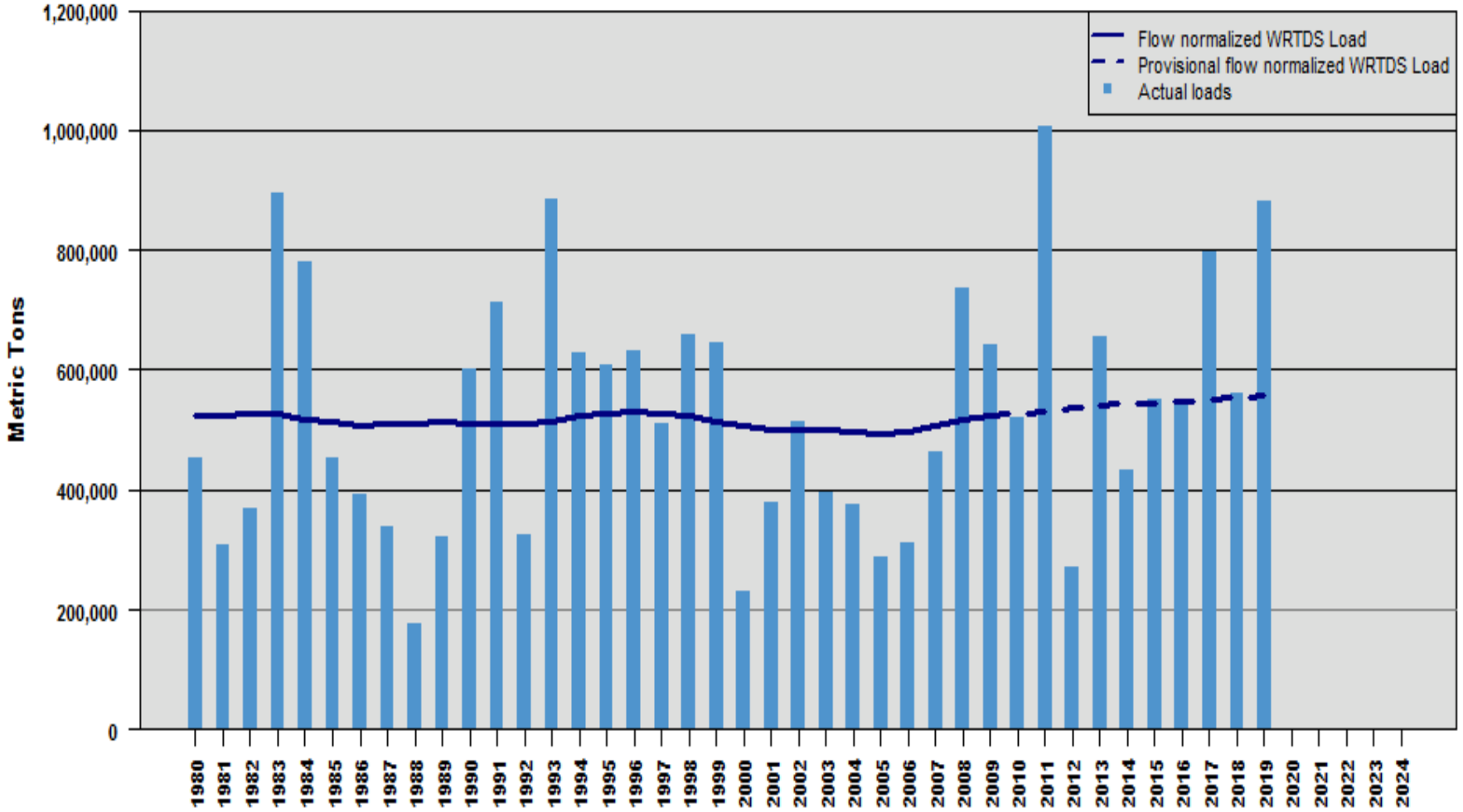
May Silica Load



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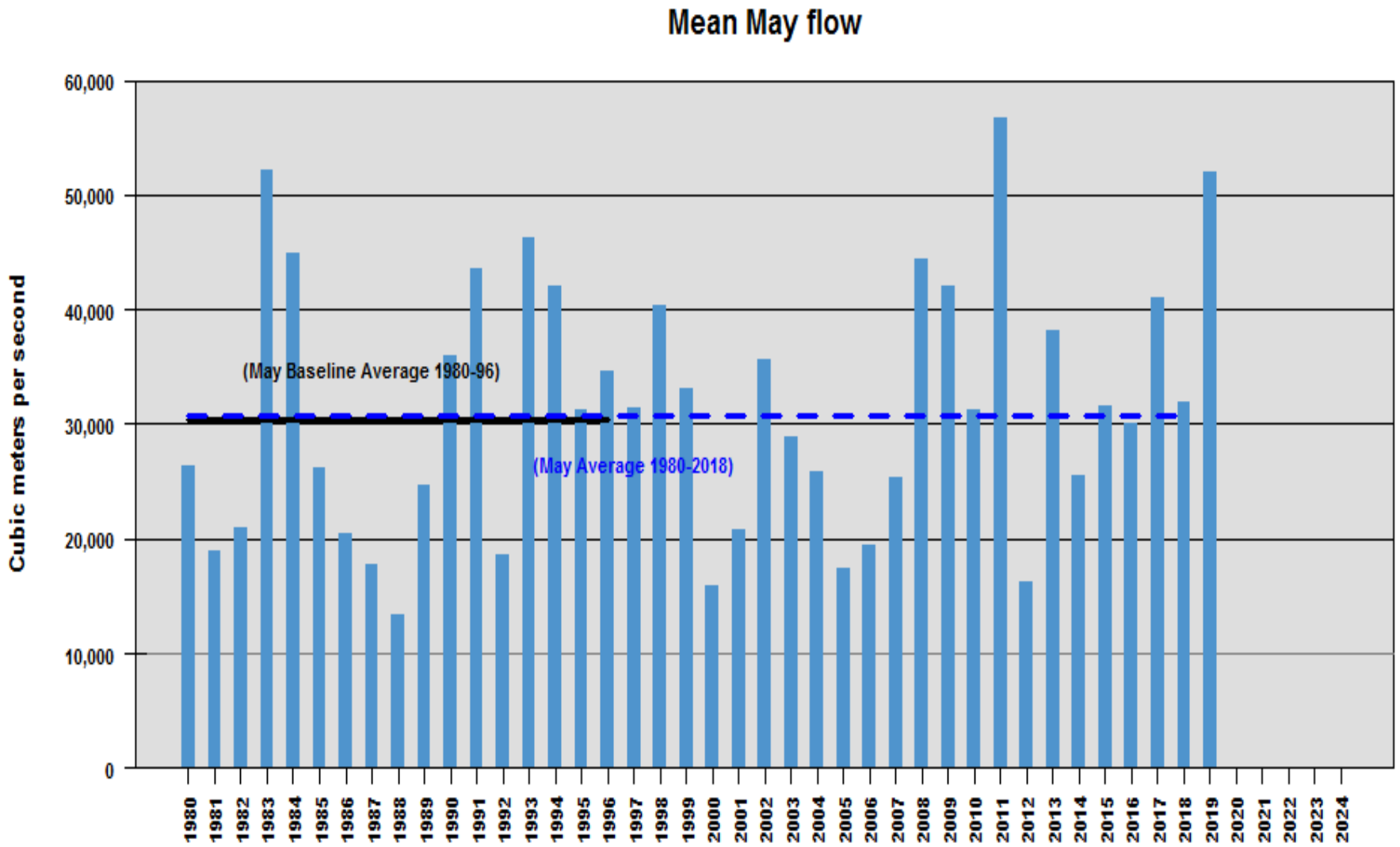

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Table 5.6 *Comparison of statewide total nitrogen loads 2011–18*

Point Source Sector	Total Nitrogen Load (million lb/yr)
2011 Baseline	87.3
Total Nitrogen Load	78.5
Reductions from 2011 Baseline	8.8 (10%)

Table 5.3. *Statewide total phosphorus loads by the point source sector in 2018*

Point Source Sector	Total Phosphorus Load (million lb/yr)
2011 Baseline	18.1
2018 Total Phosphorus Load › 213 Major Municipals › Minor Municipals › Major and Minor Industrials	13.8 11.1 2.4 0.3
Reductions from 2011 Baseline	4.3 (24%)

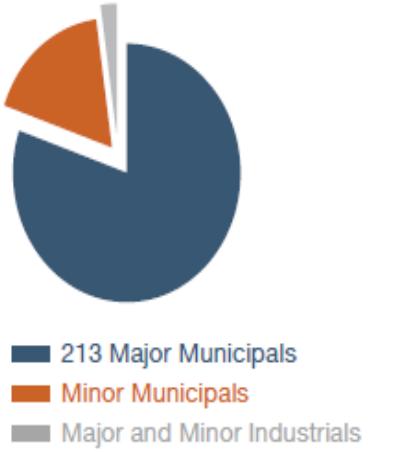

Figure 5.2 *Statewide total phosphorus loads by the point source sector in 2018*

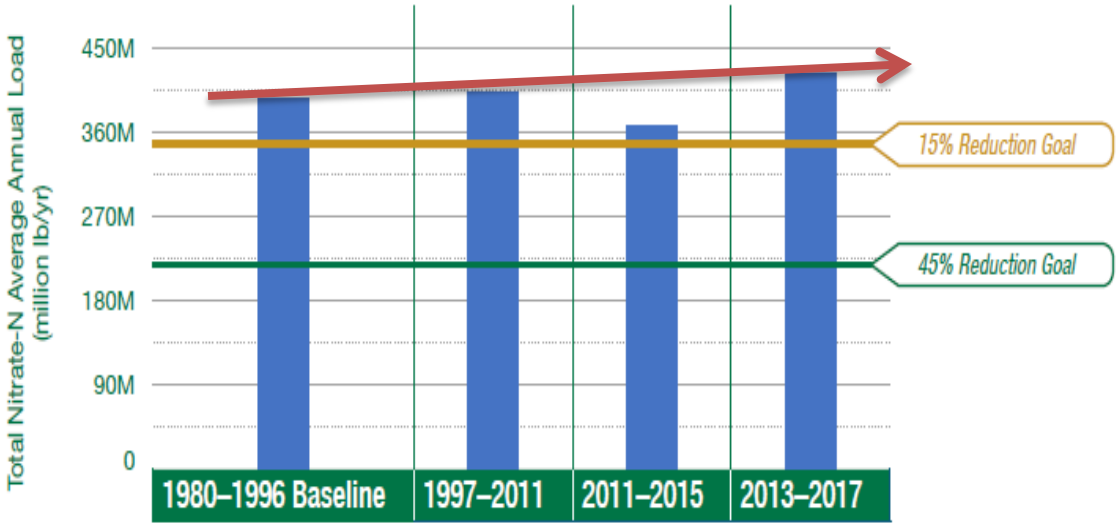

Figure 8.1. *Illinois Nitrate Load*

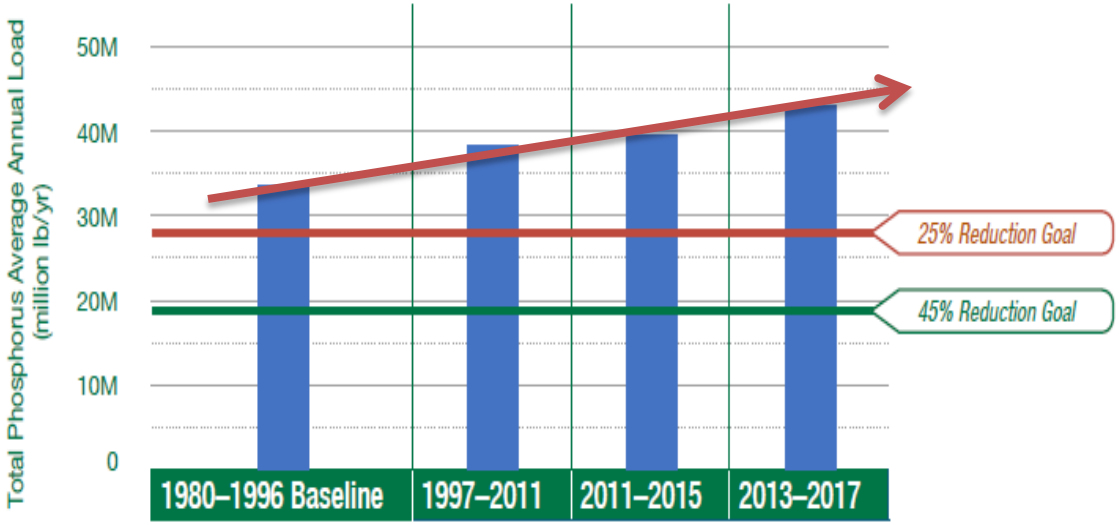

Figure 8.2. *Illinois Total Phosphorus Load*

Nitrate-N, Total P, and Water Flow Changes

	Baseline						
	1980-1996	1997-2011	% Change	2011-2015	% Change	2013-2017	% Change
NO_3-N*	397	410	+3.2	357	-10.0	425	+7.0
Total P*	34.0	37.5	+10.5	39.8	+17.0	43.0	+26.0
Water Flow**	1.70	1.72	+1.5	1.87	+10.0	1.92	+13.0

* Millions lbs / year

** Trillions ft^3 / year

Some data interpolated by T. Wyciskalla

Practice	Nitrate-N Reduction per acre	Nitrate-N Reduced (million lbs)
Reducing N-rate where over applied	10%	2.3
Nitrification inhibitors on fall-applied, tile-drained	10%	4.3
Split application (50% fall/50% spring) on tile-drained	7.5-10%	13
Spring-only application on tile-drained	15-20%	26
Cover crops on all tiled corn/soybean fields	30%	84
Cover crops on all non-tiled corn/soybean field	30%	33
Bioreactors on 50% of tile-drained land	25%	35
Wetlands on 35% of tile-drained land	50%	49
Buffers on all crop land (reduction for surface water)	90%	36
Perennial crops on 10% of tile-drained acres	90%	25

Practice	Total P Reduction per acre	Total P Reduced (million lbs)
1.8 million acres CT converted to Reduced or No-Till	50%	1.8
P rate reduction where there are high tests for P	7%	1.9
Cover crops on all tiled corn/soybean fields	30%	4.8
Cover crops on all tiled corn/soybean fields	15-20%	26
Cover crops on 1.6 million acres >T in Reduced or No-Till	50%	1.9
Wetlands on 25% of tile-drained land	0	0
Buffers on all applicable crop land	25-50%	4.8
Perennial crops on 1.6 million acres >T in Reduced or No-Till	90%	3.5
Perennial crops on 10% of tile-drained acres	50%	0.3

Table 4.6. *Acres in Cover Crops reported by producers to FSA*

	2011	2015	2017	2018
Cover crops	768	11,064	83,980	92,970

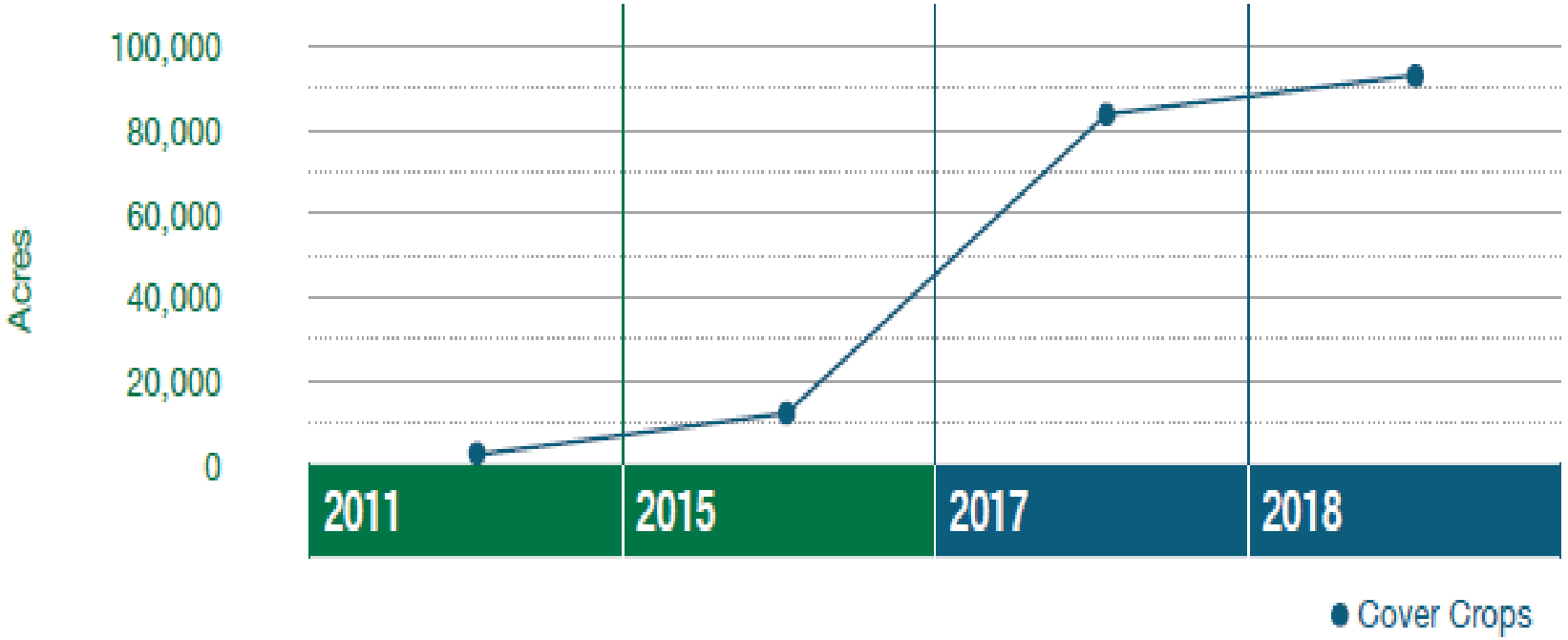

Figure 4.4. *Acres in cover crops reported by producers to the Farm Service Agency.*

Table 4.20. *Acres with reduction in phosphorus applications*

		Acres
Tiled acres	Acres where phosphorus application rates were reduced since 2011	4,440,000
Non-tiled acres	Acres where phosphorus application rates were reduced since 2011	2,150,000
Tiled acres	Acres where placement of phosphorus applications were moved from broadcast to subsurface or banding	1,530,000
Non-tiled acres	Acres where placement of phosphorus applications were moved from broadcast to subsurface or banding	280,000

Table 4.21. *Reasons cited for reducing phosphorus applications*

	Acres
Soil test information	4,520,000
Other, including cost	2,420,000
Updates to the Illinois Agronomy Handbook phosphorus removal rates	2,390,000

Table 4.3. Illinois NLRS survey result—Farmer BMP knowledge (percent reporting in 2019)

	Not at all Knowledgable	Slightly Knowledgable	Somewhat Knowledgable	Knowledgable	Very Knowledgable
Nutrient Loss Reduction Strategy	21.0%	27.0%	38.4%	11.6%	2.0%
MRTN Strategy	20.3%	33.5%	25.5%	14.1%	6.6%
Bioreactors	53.8%	23.0%	15.0%	5.5%	2.7%
Constructed Wetlands	19.7%	29.6%	38.0%	10.2%	2.5%
Cover Crops Management	15.2%	16.7%	35.5%	28.4%	4.2%

Table 4.2. Farmer knowledge of nitrate-nitrogen BMPs (NASS survey result)

	Not at all Knowledgeable	Slightly Knowledgeable	Somewhat Knowledgeable	Knowledgeable	Very Knowledgeable
Four R strategy	10.7%	13.1%	22.9%	31.3%	22%
MRTN strategy	11.5%	18.6%	26.1%	28.8%	15%
Drainage water management	8.1%	20.6%	35.8%	22.2%	13.3%
Bioreactors	43.1%	22.3%	24.8%	7.9%	1.9%