

2020 Illinois Nutrient Loss Reduction Strategy Scenarios

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ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY

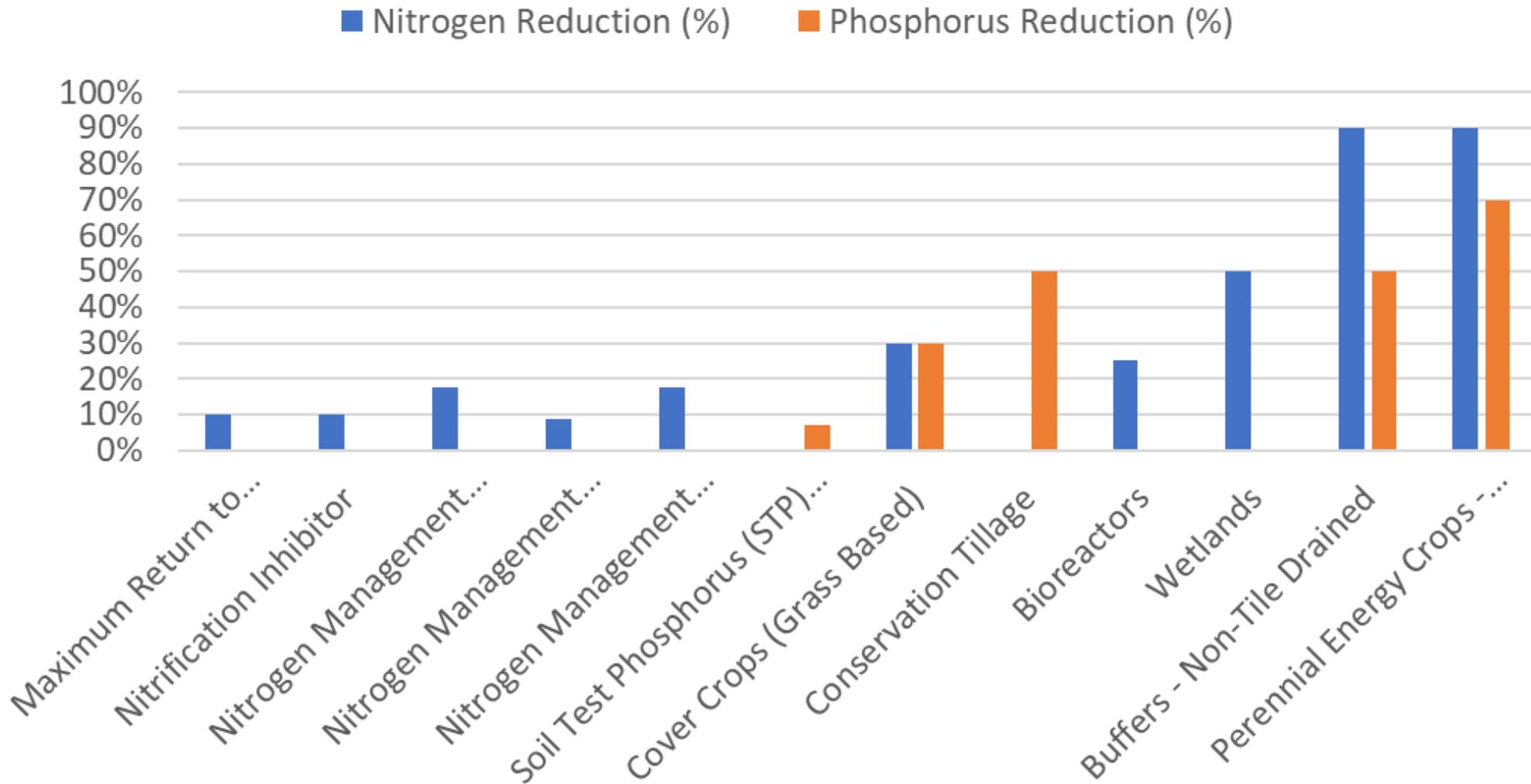
Background

- These are hypothetical scenarios
 - Not prescriptive in any way
- Need scenarios to reflect interim goals
 - 15% nitrate loss reduction (Scenario N7)
 - 25% total phosphorus loss reduction (Scenario P7)
 - Combined (Scenario NP7)
- Align scenarios with available data sources
 - Allows tracking of progress
- Point source reductions have been included
- Practice efficiencies from David et al. (2014) science assessment



Background

NLRS Practice Efficiencies



Background

- Using the 2011 benchmark period as starting point
 - So additional acres needed are from 2011
- Incorporated “practical maximum” values to limit over-use
 - Information sources vary
 - Bioreactor and wetland maximum was suggested by David et al. (2014)
 - Nitrogen management (i.e., MRTN) as all corn acres
- Rough cost optimization
 - Costs from original NLRS



Quick Overview

N7 = Interim Nitrogen Loss Reduction (15%)

P7 = Interim Phosphorus Loss Reduction (25%)

NP7 = Combined Interim Reduction

N8 = Full Nitrogen Loss Reduction (45%)

P8 = Full Phosphorus Loss Reduction (45%)

NP8 = Combined Full Reduction

What-if

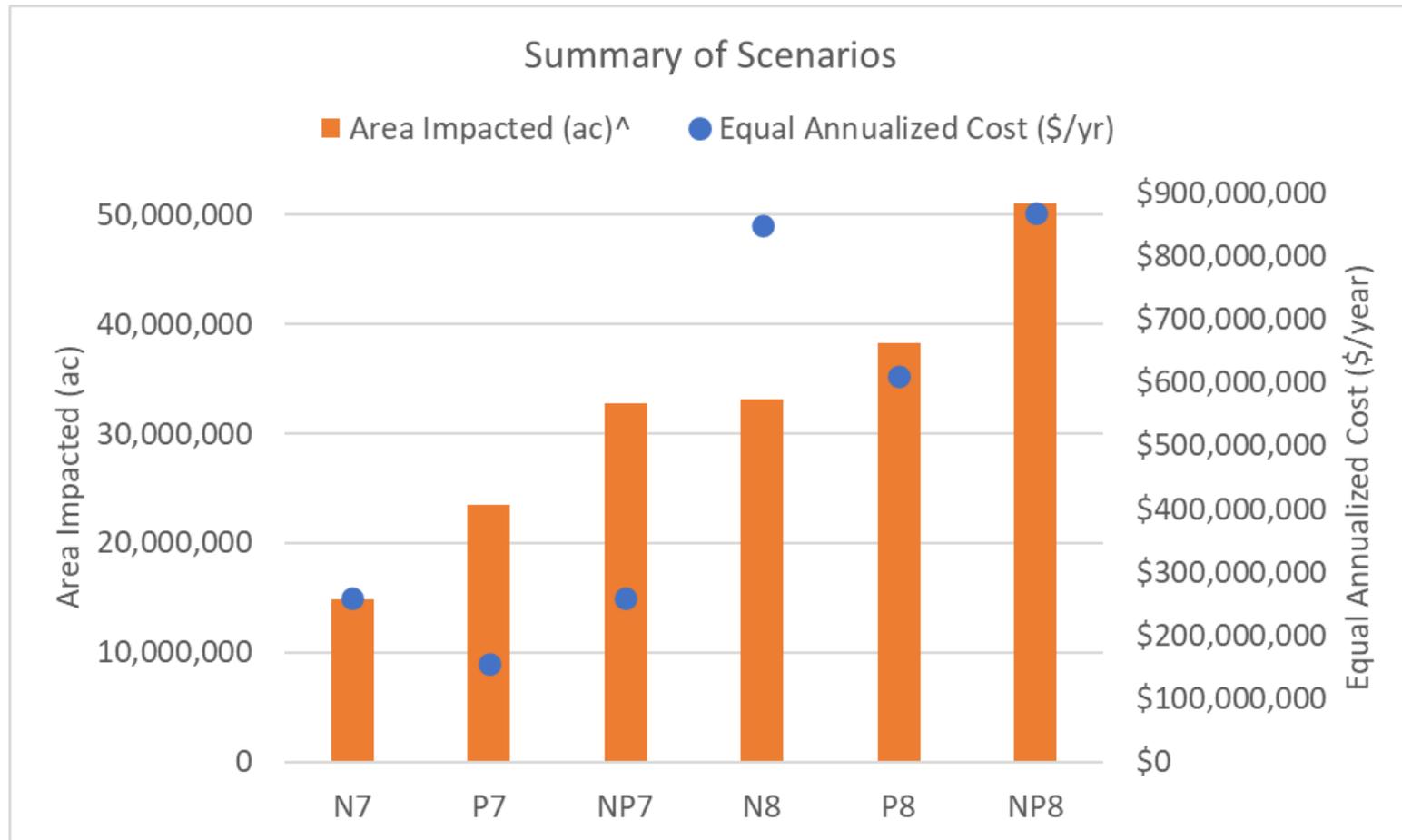
EXT1 = Detailed tillage categories

EXT2 = Saturated buffers

EXT3 = Conversion to perennial

EXT4 = Nutrient Management

EXT5 = In-Field



^Practices may be implemented on the same acreage, though no data sources are available for estimating this. There are no estimates developed showing combined impact of practices on the same area.



Scenario NP7 = 15% N and 25% P

Summary	N Reduction (lbs)^	P Reduction (lbs)^	Statewide N Reduction (%)	Statewide P Reduction (%)	Area Impacted (ac)	Net Equal Annualized Cost (EAC) (per acre)	Total Net Equal Annualized Cost (nearest \$1 million)	Equal Annualized Cost (EAC) (nearest \$1 million)	Equal Annualized Cost Savings (EACs) (nearest \$1 million)	Number of Practices
Total	61,524,293	9,374,377	15.0%	25.0%	32,759,735	\$4	\$236,000,000	\$350,000,000	-\$114,000,000	
Point Source	8,730,000	4,525,000	2.1%	12.1%	0		\$91,000,000	\$91,000,000	\$0	
Urban Stormwater	0	0	0.0%	0.0%	0	\$0	\$0	\$0	\$0	
Agriculture	52,794,293	4,849,377	12.9%	12.9%	32,759,735	\$4	\$145,000,000	\$259,000,000	-\$114,000,000	7
--General Agriculture	3,798,294	3,350,652	0.9%	8.9%	20,308,980	-\$6	-\$114,000,000	\$0	-\$114,000,000	3
--Tile-Drained Agriculture	30,402,308	677,684	7.4%	1.8%	7,100,000	\$21	\$152,000,000	\$152,000,000	\$0	2
--Non-Tiled Agriculture	18,593,692	821,041	4.5%	2.2%	5,350,755	\$20	\$107,000,000	\$107,000,000	\$0	2

^ Total values leaving the state were estimated from data tables contained in the original Nutrient Loss Reduction Strategy or the supporting Science Assessment



Scenario NP7 = 15% N and 25% P

Agriculture

EAC = \$259 million

EAC Savings = \$114 million

Practice	Practice N Efficiency (%) Reduction)	Practice P Efficiency (%) Reduction)	Treated Area Needed (ac)	Benchmark (~2011) Treated Area (ac)	Increased Treated Area Needed (ac)	Adoption Needed (%)	Maximum Implementation (ac)**	State-wide N Reduction (%)	State-wide Agricultural N Reduction (%)	State-wide P Reduction (%)	State-wide Agricultural P Reduction (%)	Tracking Source(s)
Maximum Return to Nitrogen (MRTN)	10%	0%	11,200,000	8,820,000	2,380,000	100%	11,200,000	0.9%	1.2%	0.0%	0.0%	State NASS Survey
Soil Test Phosphorus (STP) (rate reduction)	0%	7%	20,602,515	8,723,535	11,878,980	100%	20,602,515	0.0%	0.0%	1.9%	4.0%	State NASS Survey
Conservation Tillage	0%	50%	20,361,992	14,311,992	6,050,000	99%	20,602,515	0.0%	0.0%	7.0%	14.7%	Tillage Transect Survey
Bioreactors	25%	0%	4,500,160	160	4,500,000	95%	4,736,773	4.4%	5.5%	0.0%	0.0%	USDA NRCS
Cover Crops (Grass Based) - Tile Drained	30%	30%	2,820,000	220,000	2,600,000	31%	9,173,269	3.0%	3.8%	1.8%	3.8%	State NASS Survey
Cover Crops (Grass Based) - Non-Tile Drained	30%	30%	3,530,000	380,000	3,150,000	31%	11,429,246	3.7%	4.6%	2.2%	4.6%	State NASS Survey
Nitrification Inhibitor - Non-Tile Drained	10%	0%	3,107,955	907,200	2,200,755	100%	3,107,955	0.9%	1.1%	0.0%	0.0%	State NASS Survey
Total					32,759,735			12.9%	16.1%	12.9%	27.1%	



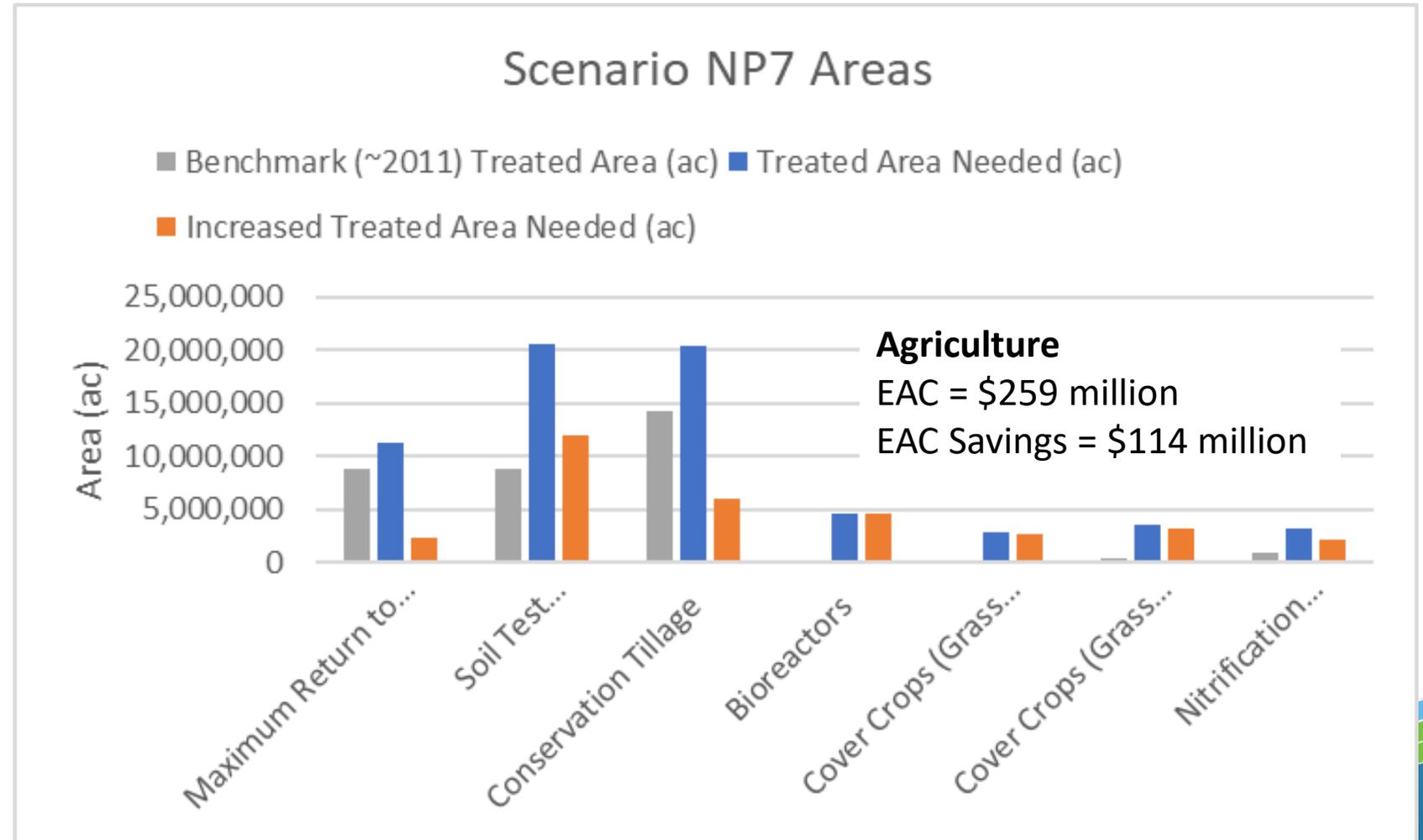
Scenario NP7 = 15% N and 25% P



From: <https://web.extension.illinois.edu/soiltest/>



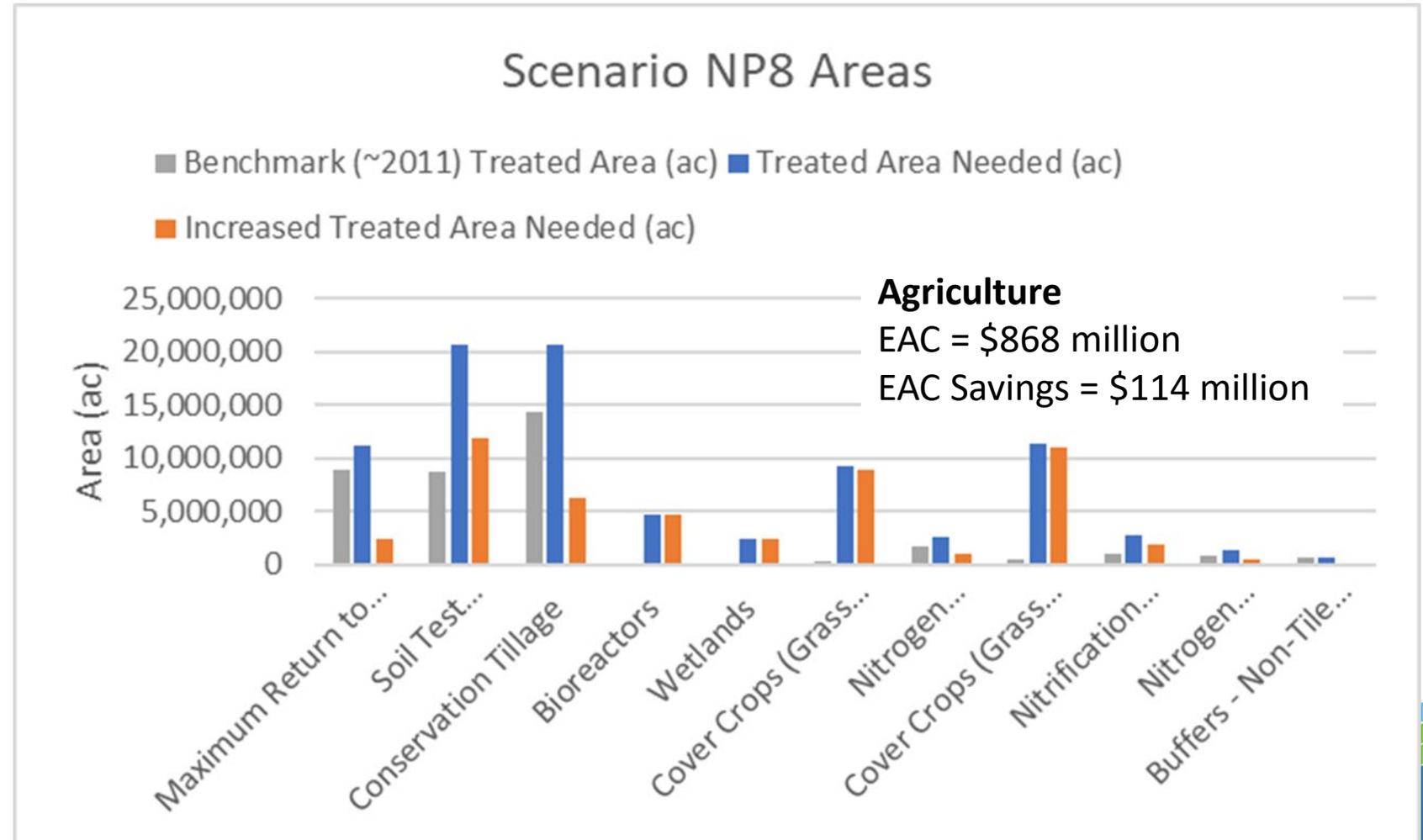
From: https://commons.wikimedia.org/wiki/File:Strip-till_2011_09_07_1709.jpg



Scenario NP8 = 45% N and 45% P



From:
<https://www.flickr.com/photos/worldpokertour/32567437501>



Extended Scenarios

- EXT1 – detailed tillage categories
 - Potential to increase phosphorus loss reduction estimates
- EXT2 – saturated buffers
 - 4.6% statewide N reduction
- EXT3 – conversion to perennial
 - 14.4 million acres to meet full N and P goals
- EXT4 – nutrient management only
 - 3.6% reduction in N and 1.9% reduction in P
- EXT5 – in-field only
 - 26.9% reduction in N and 23.1% reduction in P



Questions?



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Photo: Layne Knoche