

# Proceedings from the 12<sup>th</sup> Annual Nutrient Management Conference



**12th Annual**

**NUTRIENT MANAGEMENT CONFERENCE**

**Tuesday, February 4, 2020**

**VERIZON WIRELESS CENTER MANKATO**

**12th Annual**

**NUTRIENT MANAGEMENT CONFERENCE**

**Sessions 9:00 a.m.-3:25 p.m.**

**■ GENERAL SESSION**

8:30 a.m. *Registration*

9:00 a.m. *Welcome*  
Tom Rothman University of Minnesota

9:05 a.m. *Lessons Learned in 2019, Opportunities for 2020*  
Liz Stahl University of Minnesota  
Brad Carlson University of Minnesota

9:55 a.m. *Importance of Urban and Non-Urban Nutrient Reductions*  
Katrina Kessler Minnesota Pollution Control Agency

10:30 a.m. *Break*

10:45 a.m. *Farmers Working To Reduce Nutrient Losses*  
Brian Ryberg, Brian Biegler, Dan Coffman

11:45 *Lunch*

**■ BREAKOUT SESSION #1 - NUTRIENT REDUCTION STRATEGY TRACK**

12:45 p.m. *Minnesota's Nutrient Reduction Strategy- Progress Toward Milestone Goals*  
Glenn Skuta Minnesota Pollution Control Agency

1:25 p.m. *Urban Efforts to Reduce Nutrient Pollution*  
Katrina Kessler Minnesota Pollution Control Agency

2:05 p.m. *Potential for Cover Crops to Improve Nutrient Use Efficiency*  
Axel Garcia y Garcia University of Minnesota

2:45 p.m. *Tile Drainage, Cover Crops and Nitrogen Interactions*  
Jeffrey Vetsch University of Minnesota

**■ BREAKOUT SESSION #2 RESEARCH TRACK**

12:45 p.m. *Looking at Soil Health Tests*  
Anna Cates, Liz Stahl University of Minnesota

1:25 p.m. *Evaluating Biologicals*  
Dan Kaiser University of Minnesota

2:05 p.m. *Updating MN's P Index*  
Lindsay Pease University of Minnesota

2:45 p.m. *Liquid Swine Manure - A Viable Nutrient Source for Sidedressing Corn?*  
Melissa Wilson University of Minnesota

3:25 p.m. *Adjourn*

Thank you to all of our Supporters!

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# Updating the Minnesota Phosphorus Index

**Dr. Lindsay Pease, Assistant Professor and Extension Specialist**

Department of Soil, Water, and Climate

University of Minnesota Northwest Research & Outreach Center





# Why do we need a change?

1. Growing need for P loss risk assessment in MN
2. Edge-of-field data collection has vastly improved since 2006
3. Revised Universal Soil Loss Equation (RUSLE2) transitioning to the Water Erosion Prediction Project (WEPP) in NRCS policies
4. Program is not user-friendly

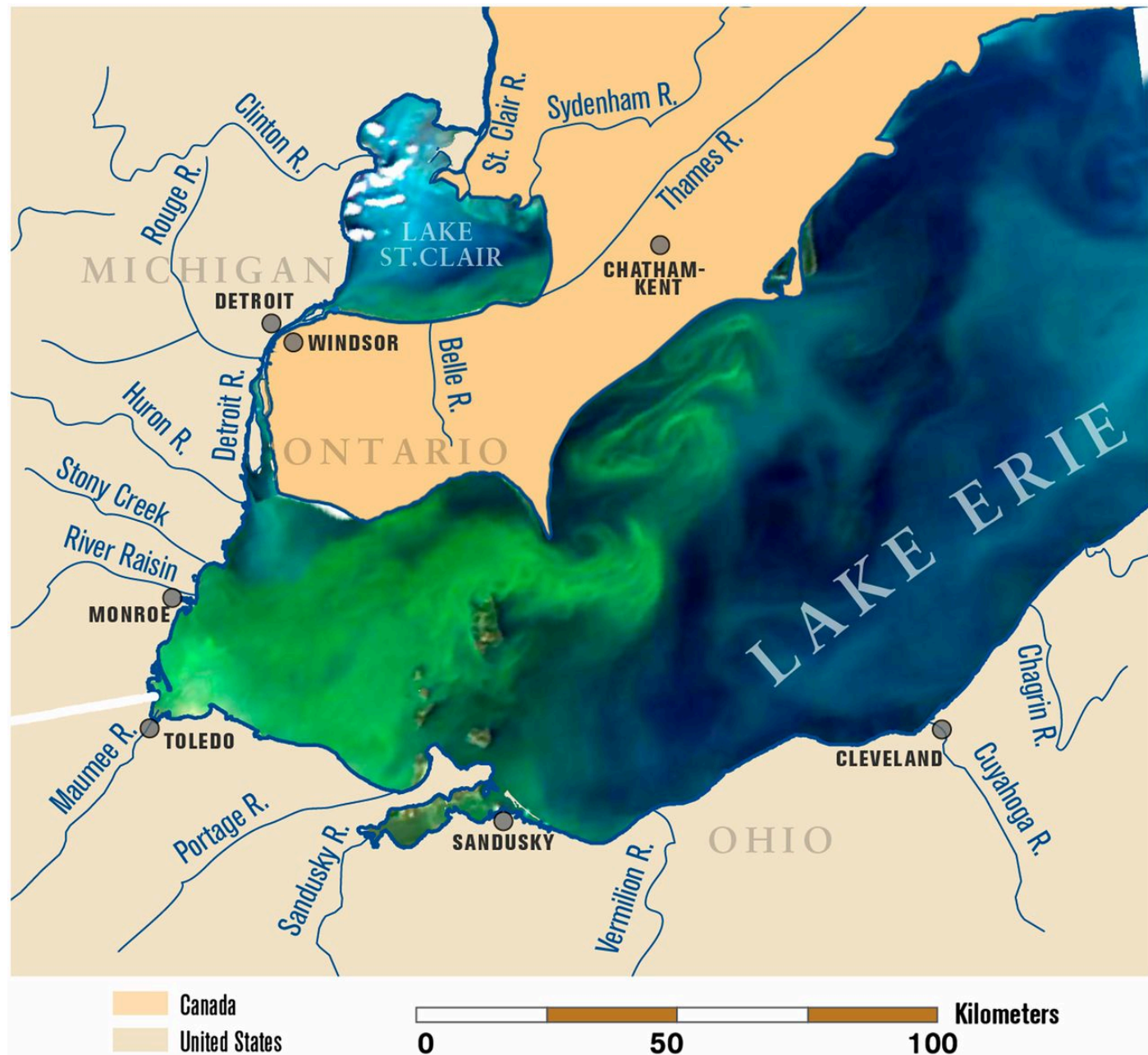


# MN needs better P loss risk assessment

A little P loss can cause a lot of damage downstream

- Concentration target for Nitrate = 10 ppm
- Concentration target for Dissolved P = 0.04 ppm





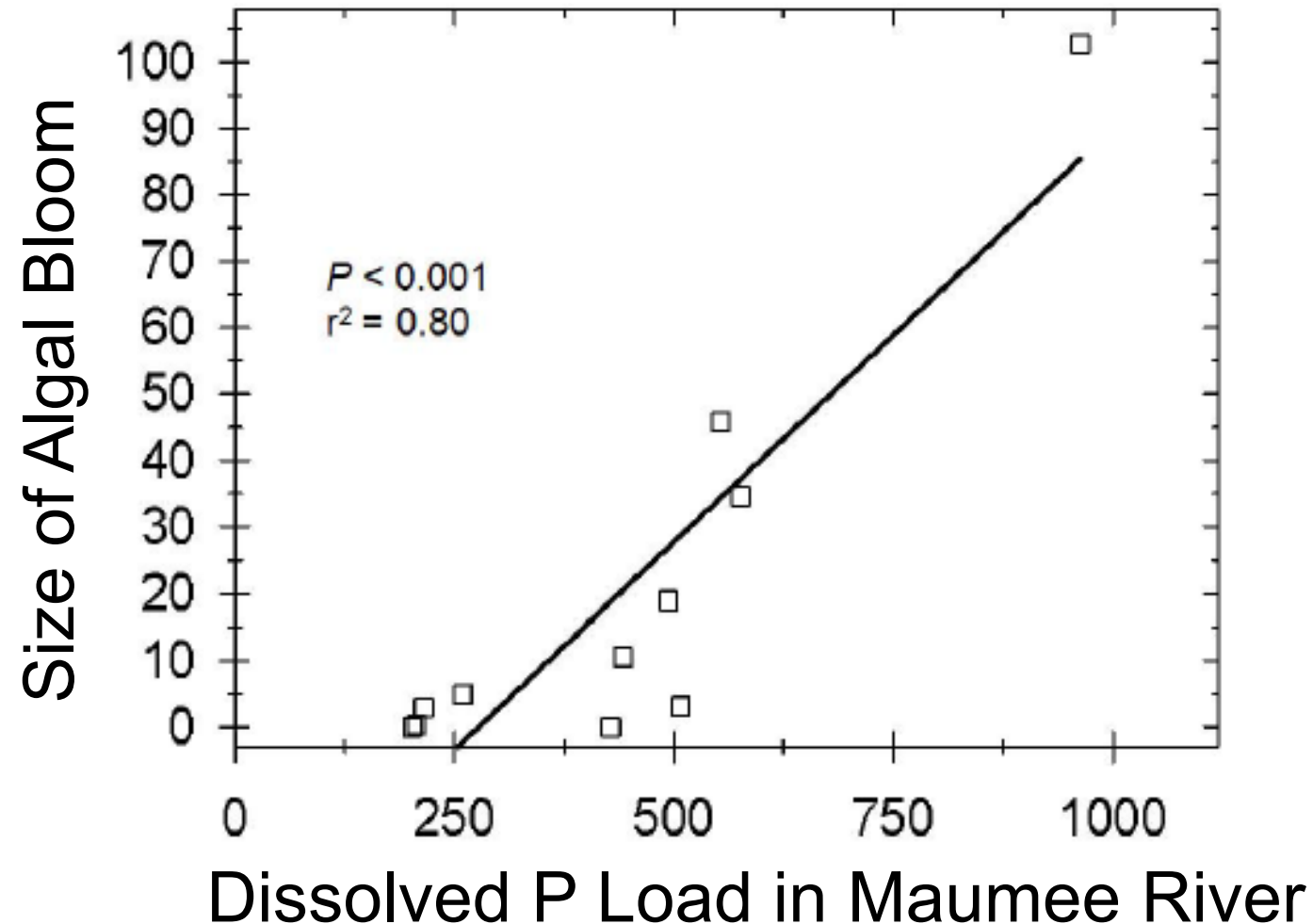




Credit: Joshua Lott/Reuters (2014)

**“400,000 in Ohio without drinking water”  
-Chicago Tribune, 8/3/14**

# Dissolved P Load Predicts Bloom Size



*Kane et al. 2014*







# Ancient Roman Baths Bath, England



## Algae covers stretch of beach on Lake Winnipeg



Beachgoers say Grand Beach was covered in green sludge on Monday

Holly Caruk · CBC News · Posted: Aug 15, 2016 9:59 PM CT | Last Updated: August 15, 2016



Photo: Harley Hudon



Photo: Monique Andrew



Photo: Gabie Tolkmitt



Algae

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Dog owners beware of slimy blue-green algae

## Algae Fatal To Dogs Found In Minnesota: Health Officials

Over the last few weeks, reports of dogs dying due to blue-green algae toxicity have been reported in several states.

By William Bornhoft, Patch Staff ✓  
Aug 12, 2019 10:06 am CT

## DOG DIES AFTER SWIMMING IN ROCHESTER'S FOSTER-AREND POND



KIM DAVID | July 12, 2019

Photo: Harley Hudon

Photo: Gabie Tolkmitt









*Have fun on the water, but know that blue-green algae are in many Ohio lakes. Their toxins may be, too.*

**Be Alert! Avoid water that:**

- looks like spilled paint
- has surface scums, mats or films
- is discolored or has colored streaks
- has green globs floating below the surface



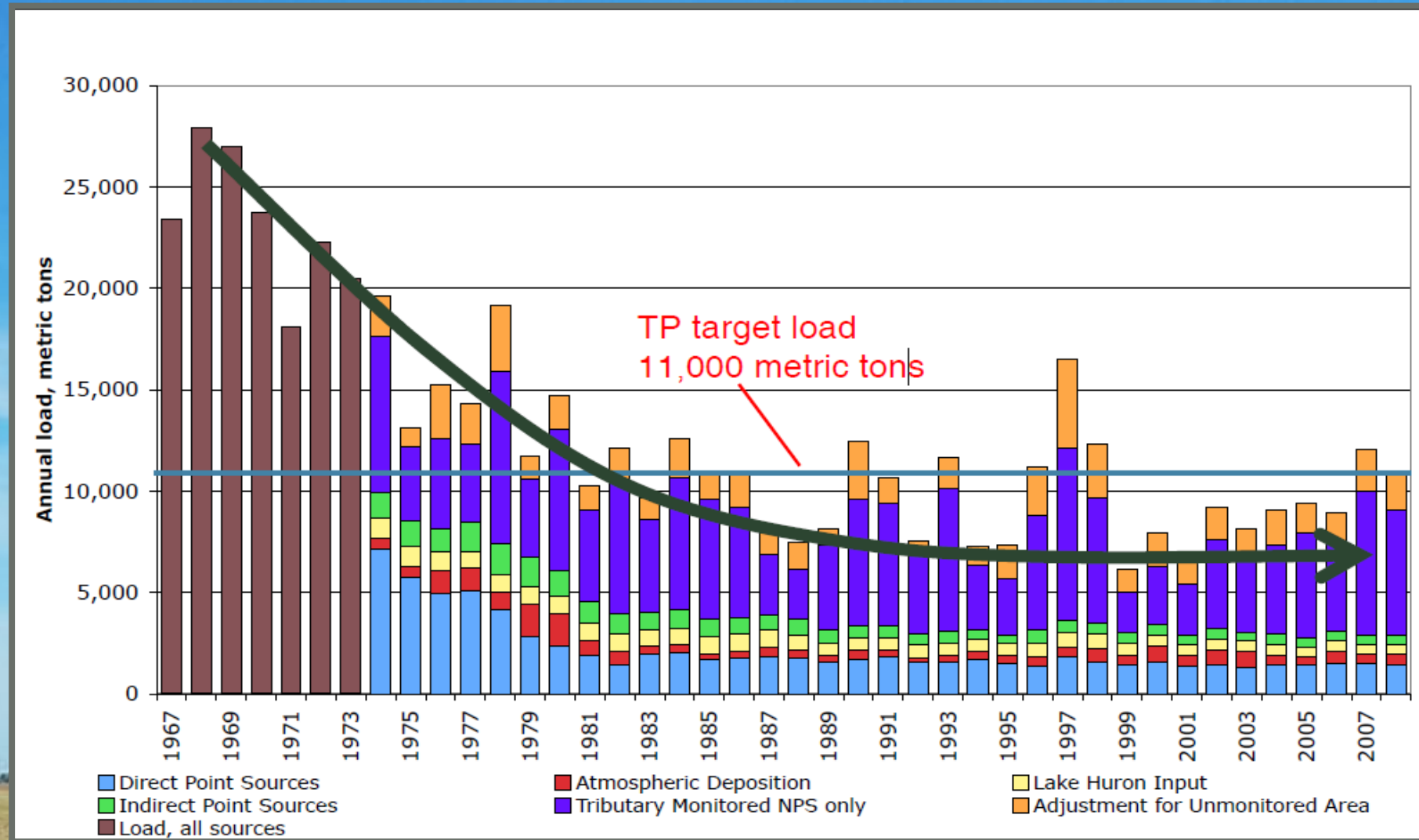
**Avoid swallowing lake water.**

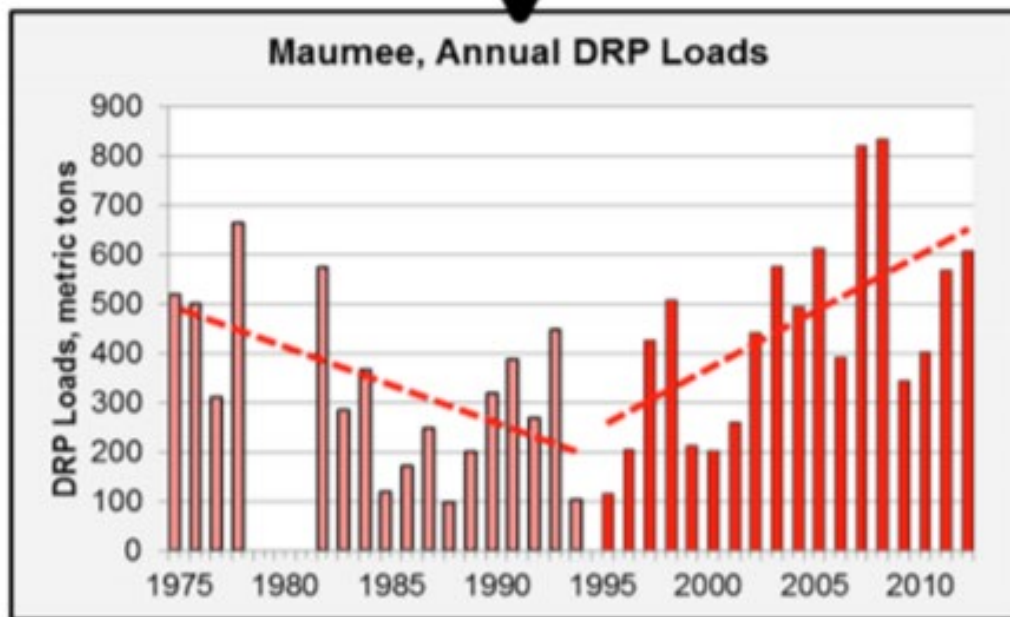
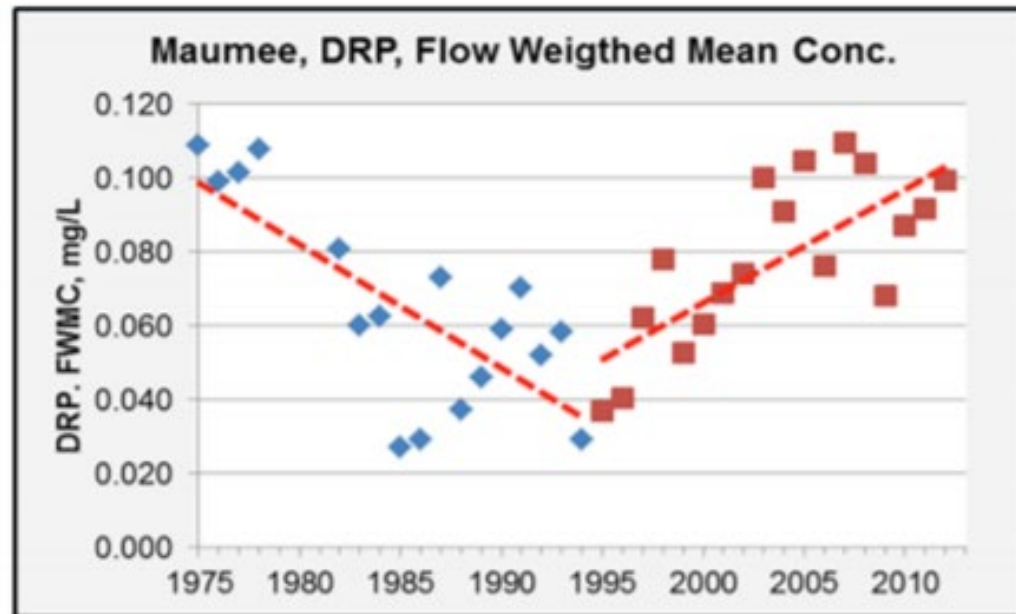
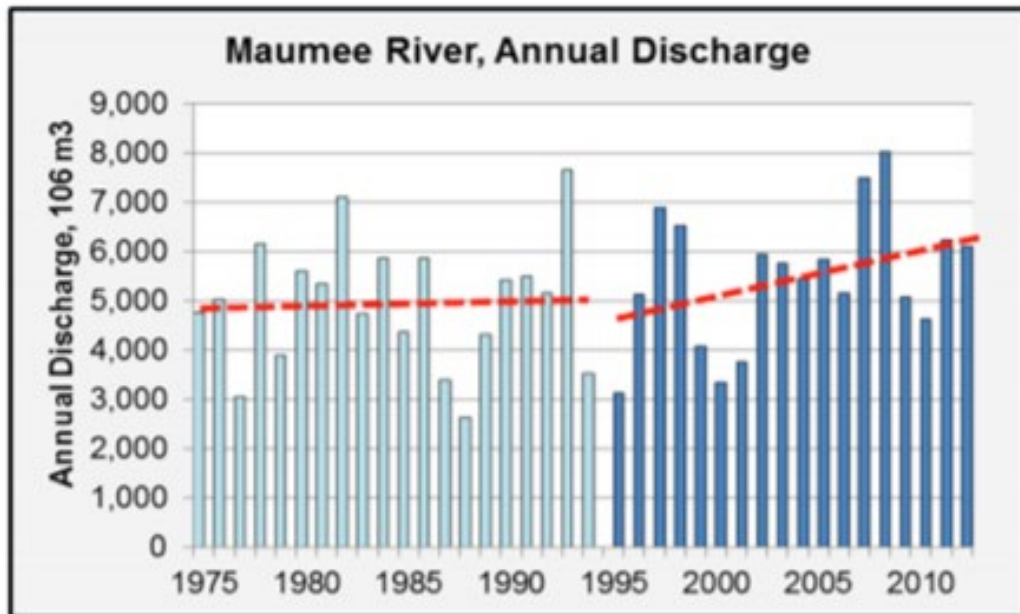
For more information, visit  
[ohioalgaeinfo.com](http://ohioalgaeinfo.com)  
or call 1-866-644-6224.





# Lake Erie Eutrophication: *Historical Success*

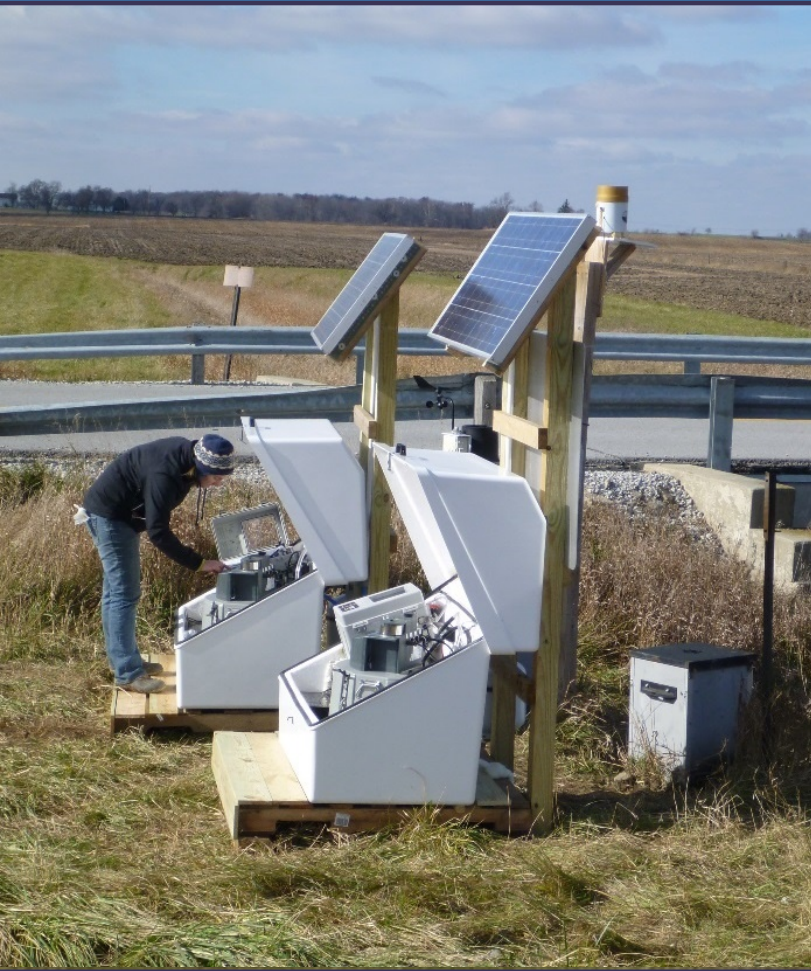






# Edge-of-Field Data Collection

On-farm Field Sites



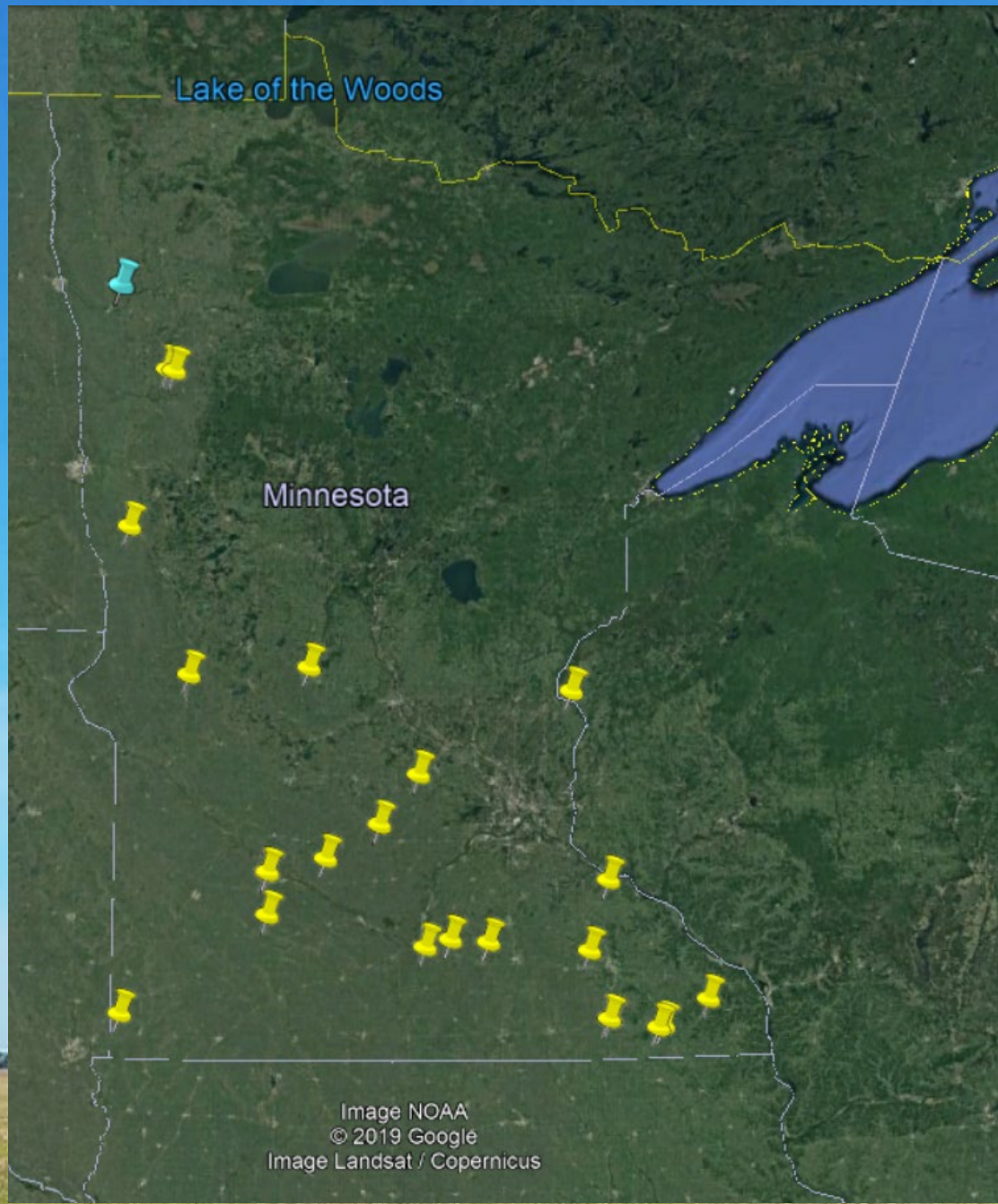
Surface Runoff



Subsurface Drainage







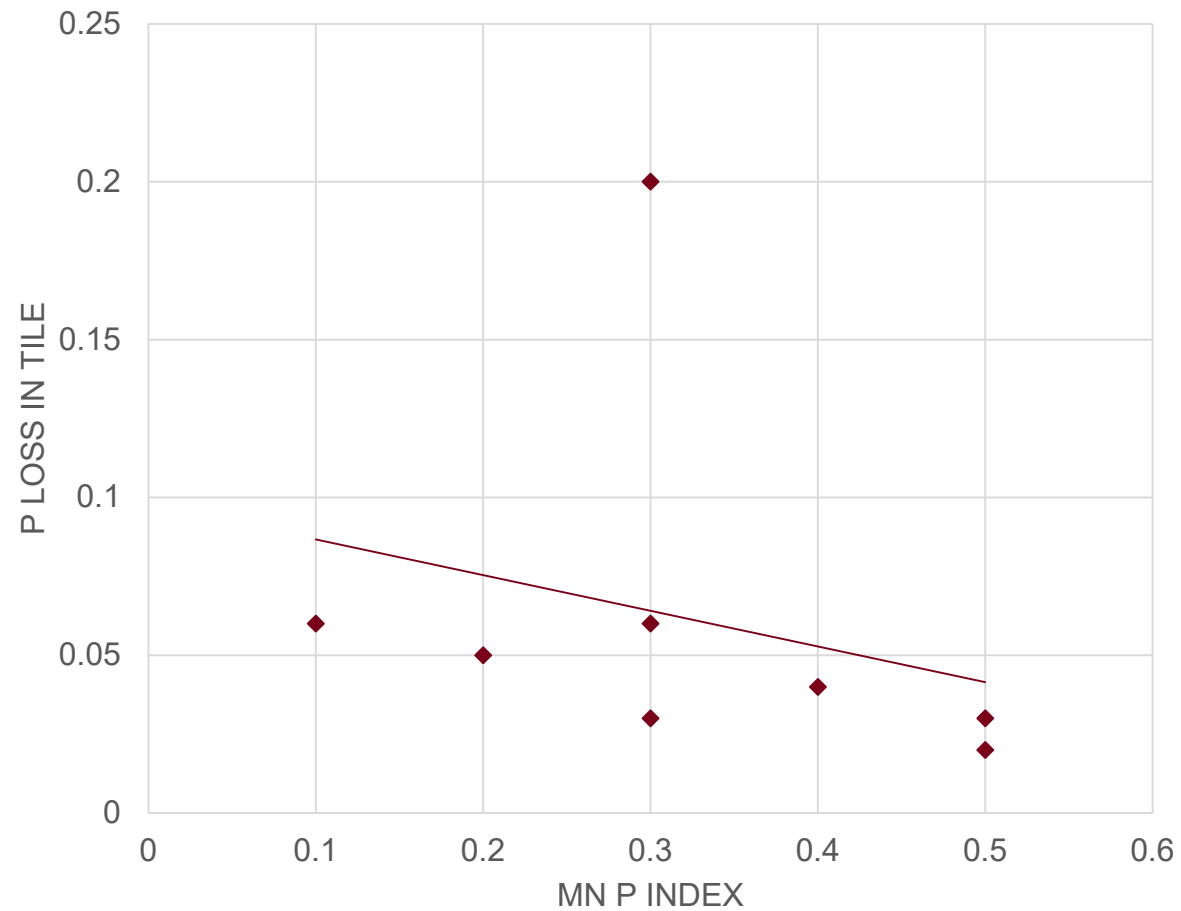


# Is the MN P Index Working?

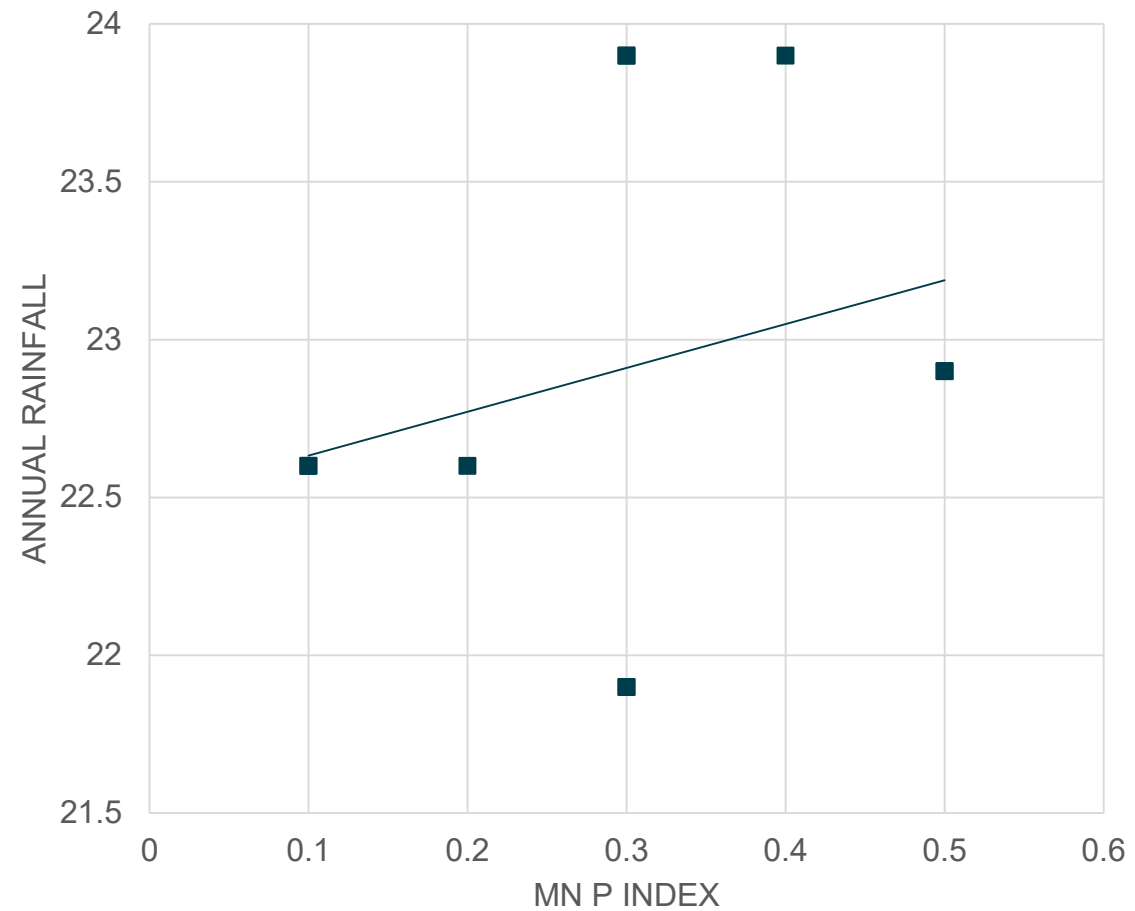
- Compare Risk Assessment results with new Edge-of-Field Data
- Make adjustments to risk calculation and/or rating



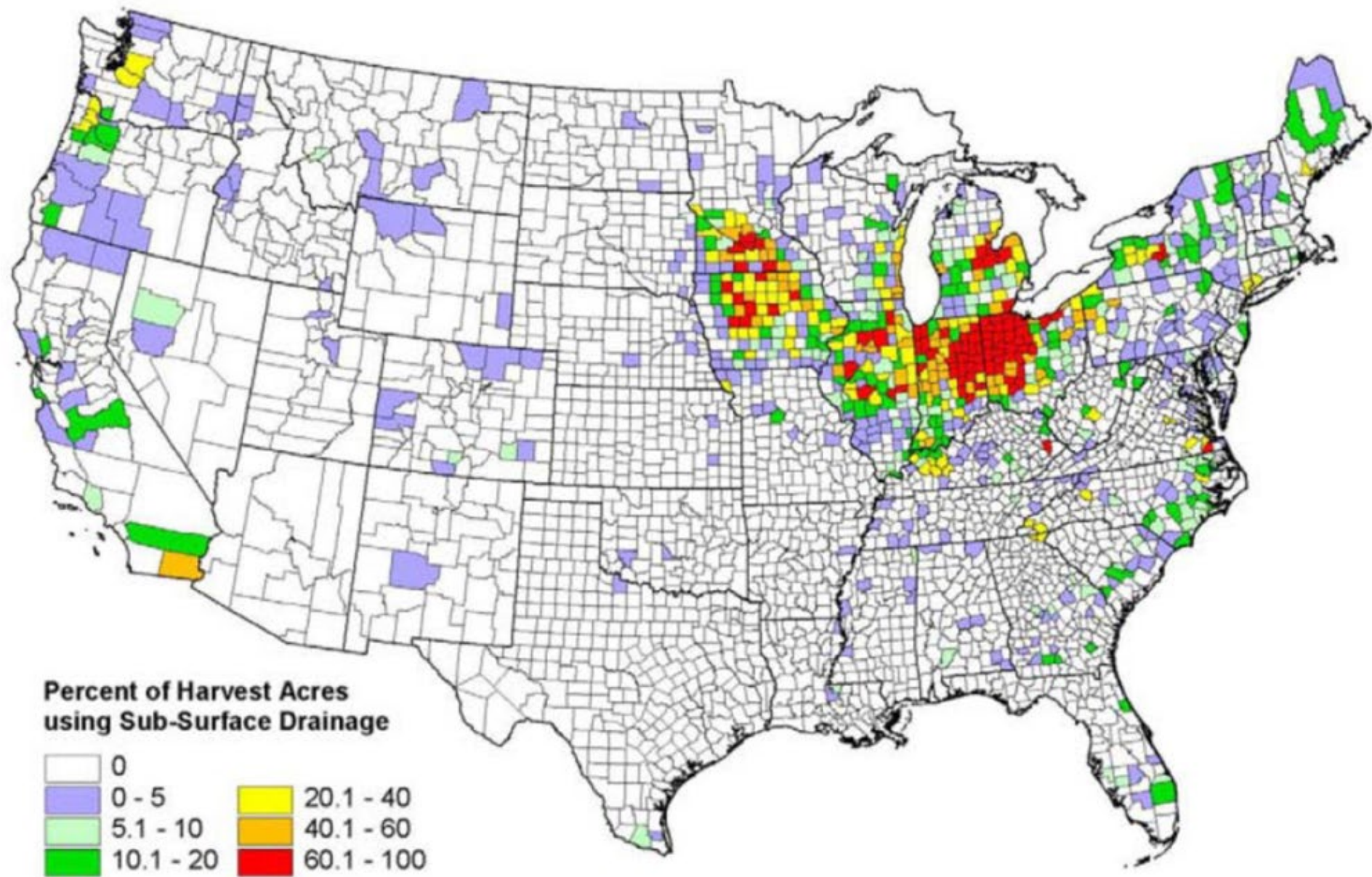
## P LOSS IN TILE



## ANNUAL PRECIP



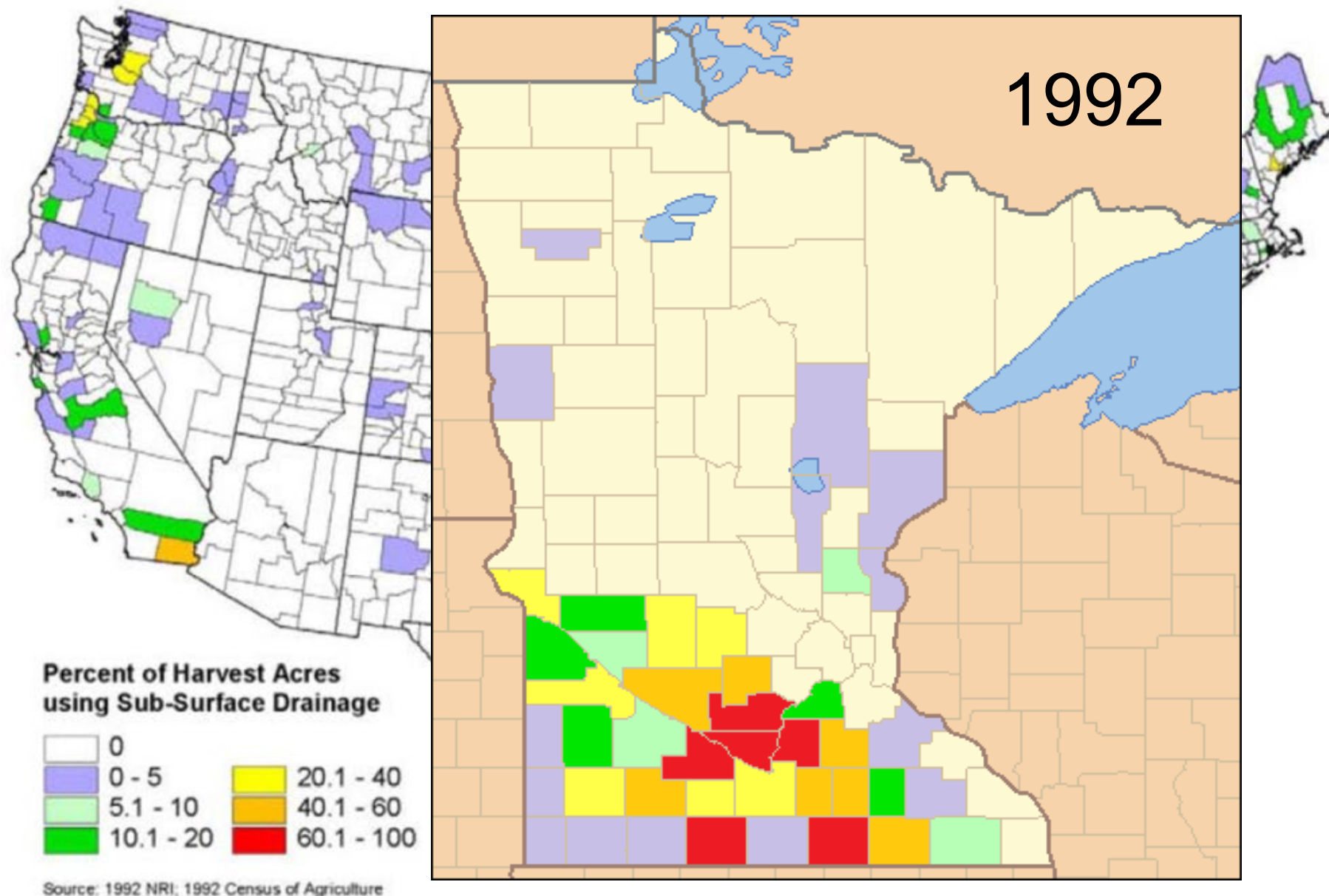




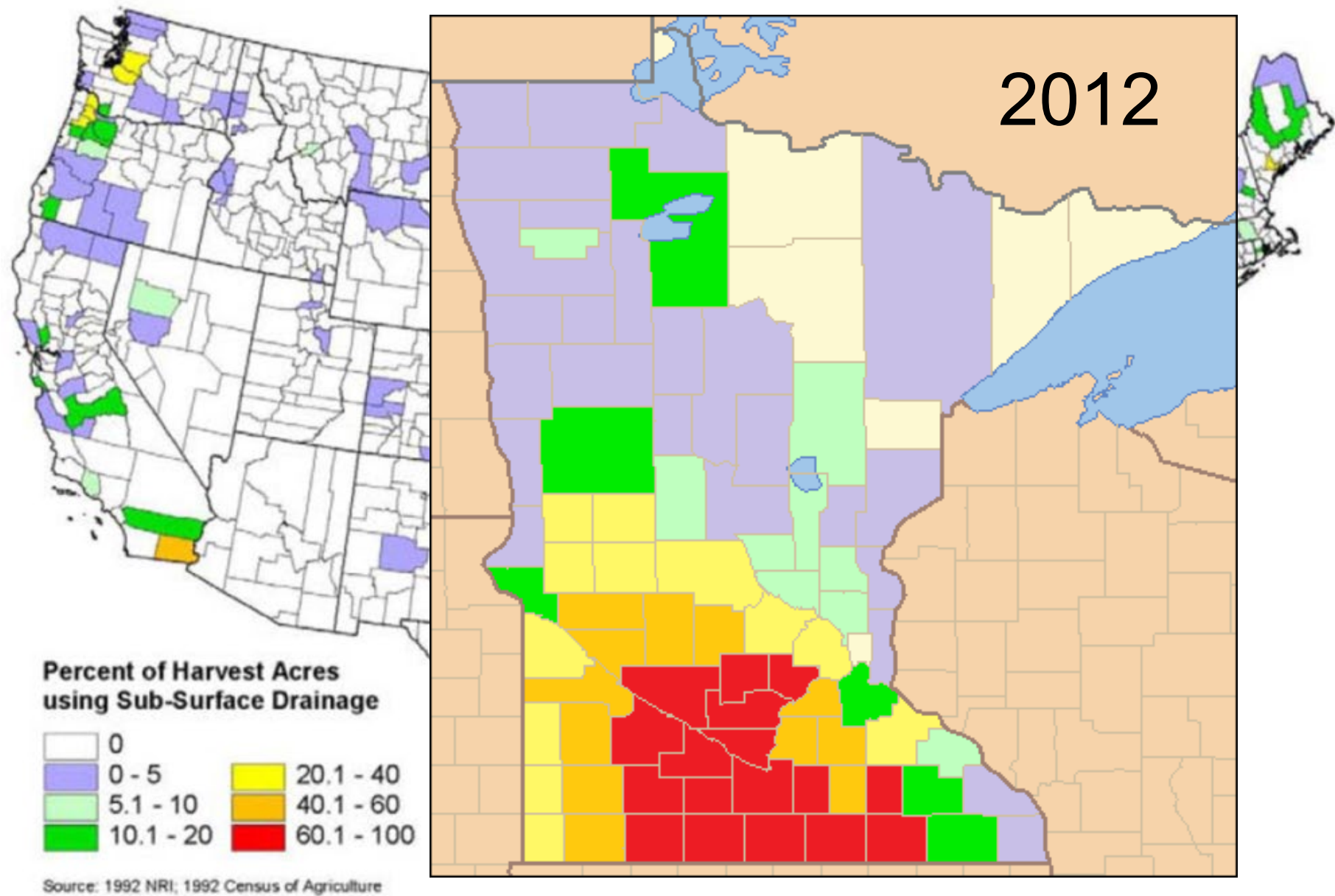
Source: 1992 NRI; 1992 Census of Agriculture

**Figure 28 — Percent of harvest acres in the United States using subsurface drainage in 1992.**  
(NRI Census of Agriculture, 1992)





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(NRI Census of Agriculture, 1992)



# Updates to the Program

- Update the risk calculation algorithm
- Replace RUSLE2 with WEPP in internal algorithm
- Develop a new format to improve accessibility



# What's Next?

- MN P Index Assessment (Ongoing)
- Redevelopment of algorithm and program (Spring through Fall 2020)
- Roll out of MN P Index (Winter 2021)
  - In-person training sessions
  - Online training materials





# 4R Principles of Nutrient Stewardship



## RIGHT SOURCE

Matches fertilizer type to crop needs.



## RIGHT RATE

Matches amount of fertilizer to crop needs.



## RIGHT TIME

Makes nutrients available when crops need them.



## RIGHT PLACE

Keeps nutrients where crops can use them.



# Soil test phosphorus (P) Interpretation Classes and associated extracted-P concentrations used in Minnesota.

	Minnesota STP Category				
Extractant	Very Low	Low	Medium	High	Very High
	----- ppm P extracted -----				
Bray-P	0-5	6-11	12-15	16-20	21+
Olsen-P	0-3	4-7	8-11	12-15	16+



# Phosphorus Management

- Don't use your soil as a bank
- Over-application of P fertilizer isn't economical

To reduce loss risk:

- Fertilize for each crop
- Band or incorporate P fertilizer



# Project Team

## Department of Soil, Water, and Climate

- Dr. Lindsay Pease
- Dr. Melissa Wilson
- Dr. Daniel Kaiser
- Dr. Paulo Pagliari
- Graduate student Heidi Reitmeier

Funding through UMN MAES Rapid Agricultural Response Fund





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