

JERSEY VALLEY WATERSHED WATER QUALITY MONITORING

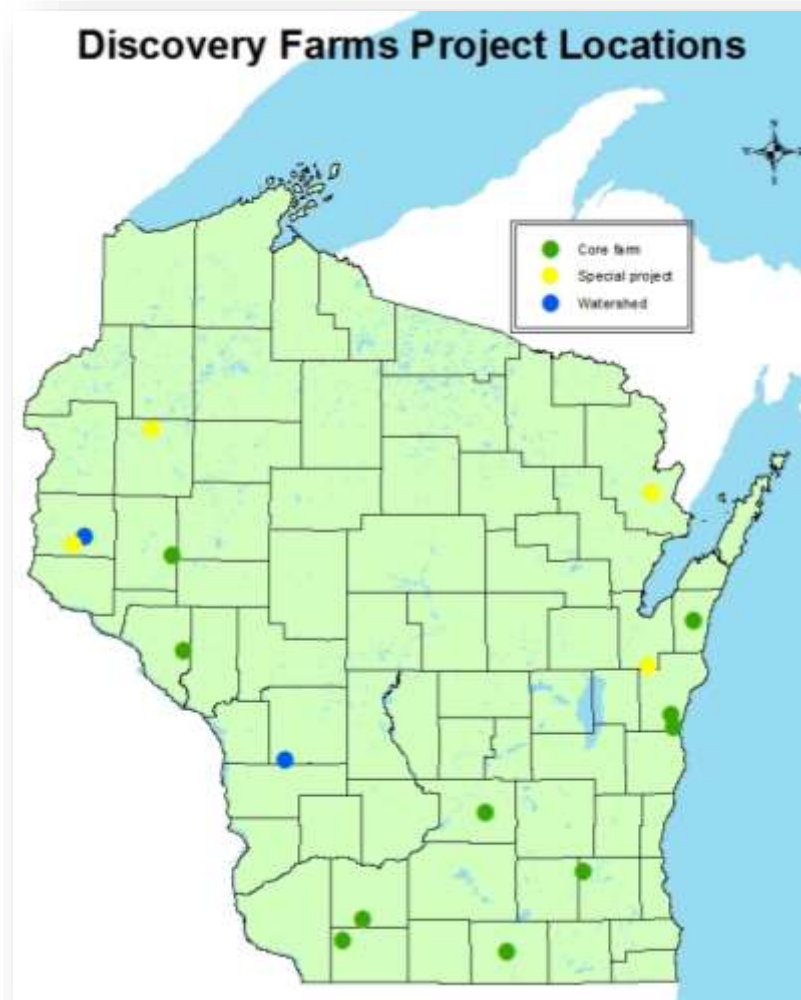


Callie Herron
March 5th, 2015
Oconomowoc, WI
AWRA Conference



UW-Discovery Farms

- On-Farm Water Quality Monitoring
- Measure: P, N, Sediment
- Edge-of-Field
- Tile
- Stream
- Jersey Valley - Lake

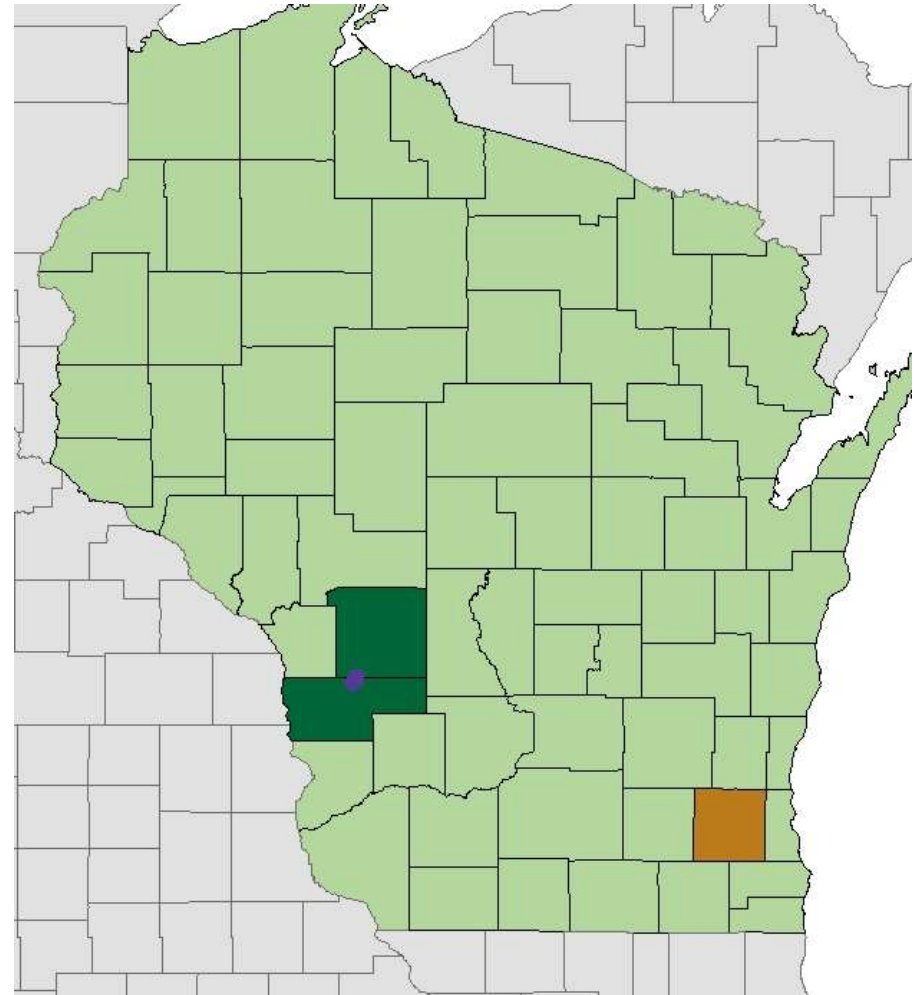


Presentation Overview

- Journey through the Jersey Valley Watershed
 - Driftless Region
 - Watershed
 - Edge-of-Field
 - Sediment and Phosphorus Loss
 - Stream
 - Phosphorus and Biotic Index
 - Lake
 - Phosphorus and Chlorophyll-a
- Conclusions

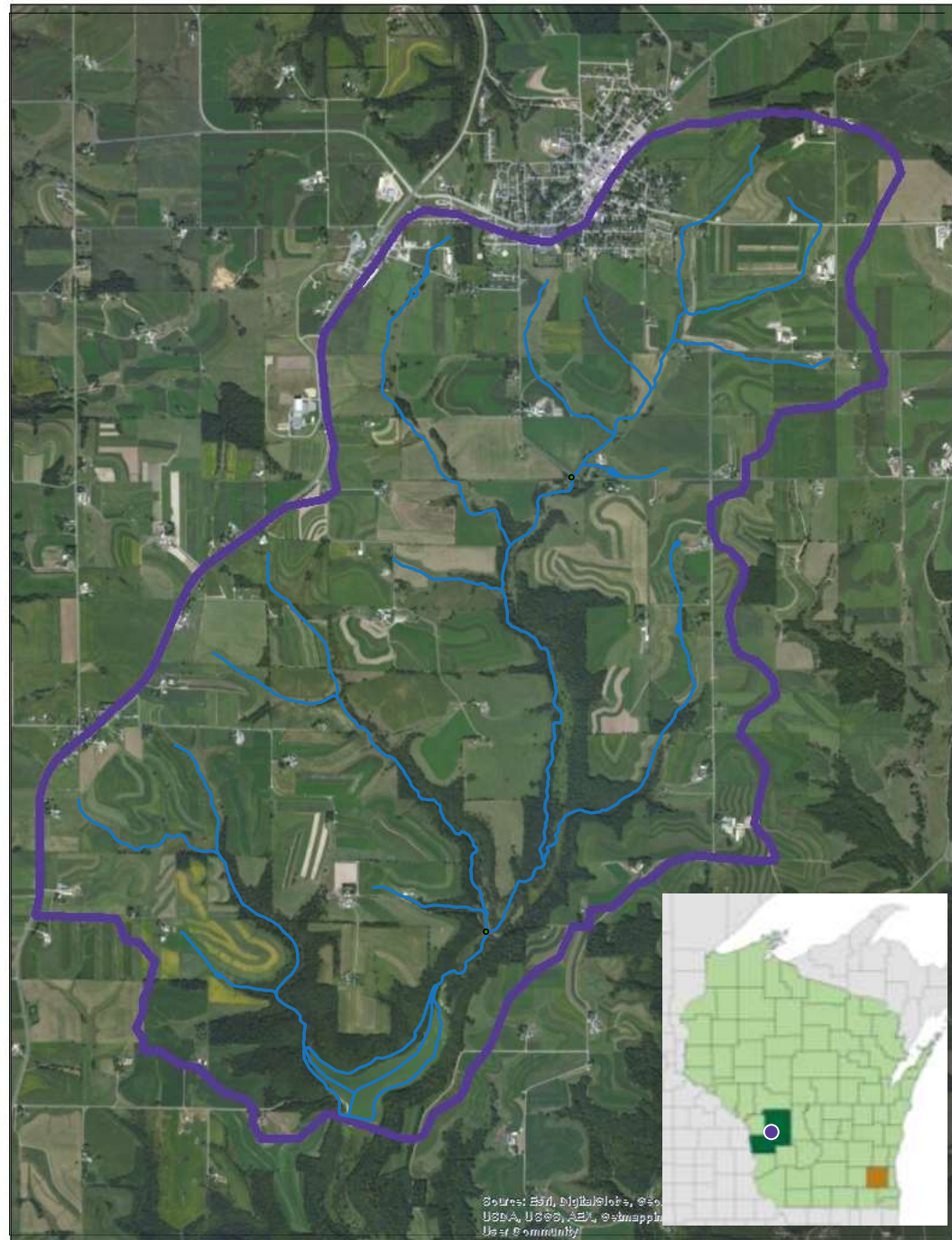
Driftless Region

- Flat top ridges
- Steep side slopes
- Narrow valleys
- Highly susceptible to runoff
- Issue of nutrient transport

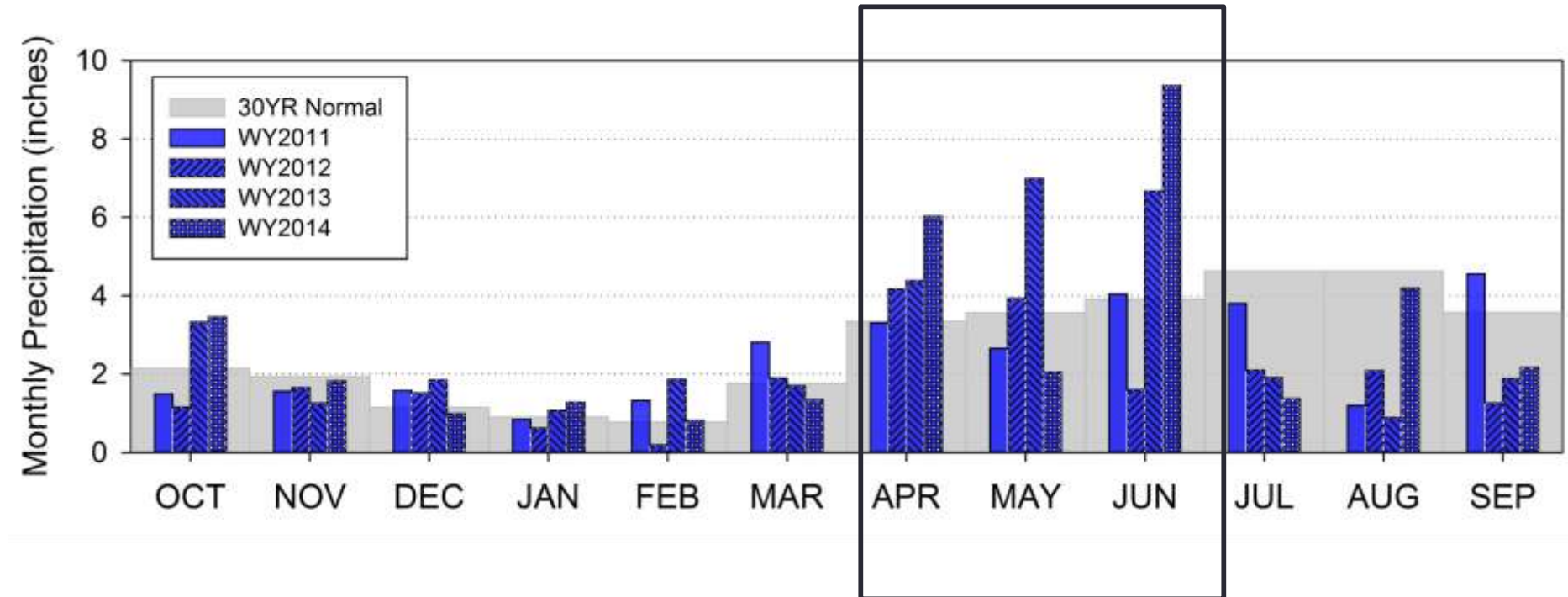


Watershed

- 5,000 Acres
- 70% Agricultural
- Corn, Hay, Other Forages
- No-Till, Contour Strips, Grass Waterways

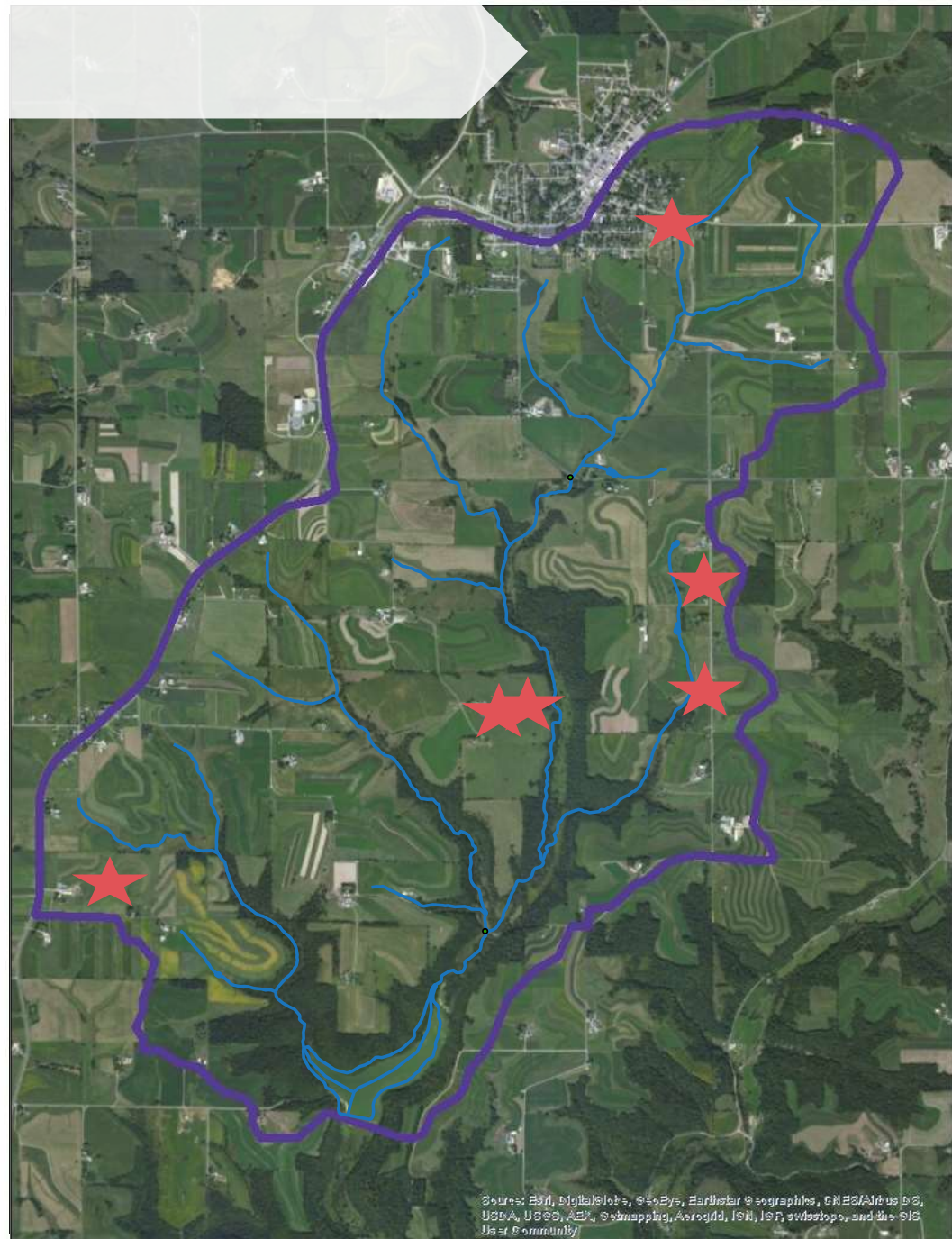


Precipitation



Edge-of-Field

4 within agricultural fields
1 in a non-cultivated wooded area
1 within a culvert that drains water
from part of the City of Cashton
N, P, Sediment, Runoff

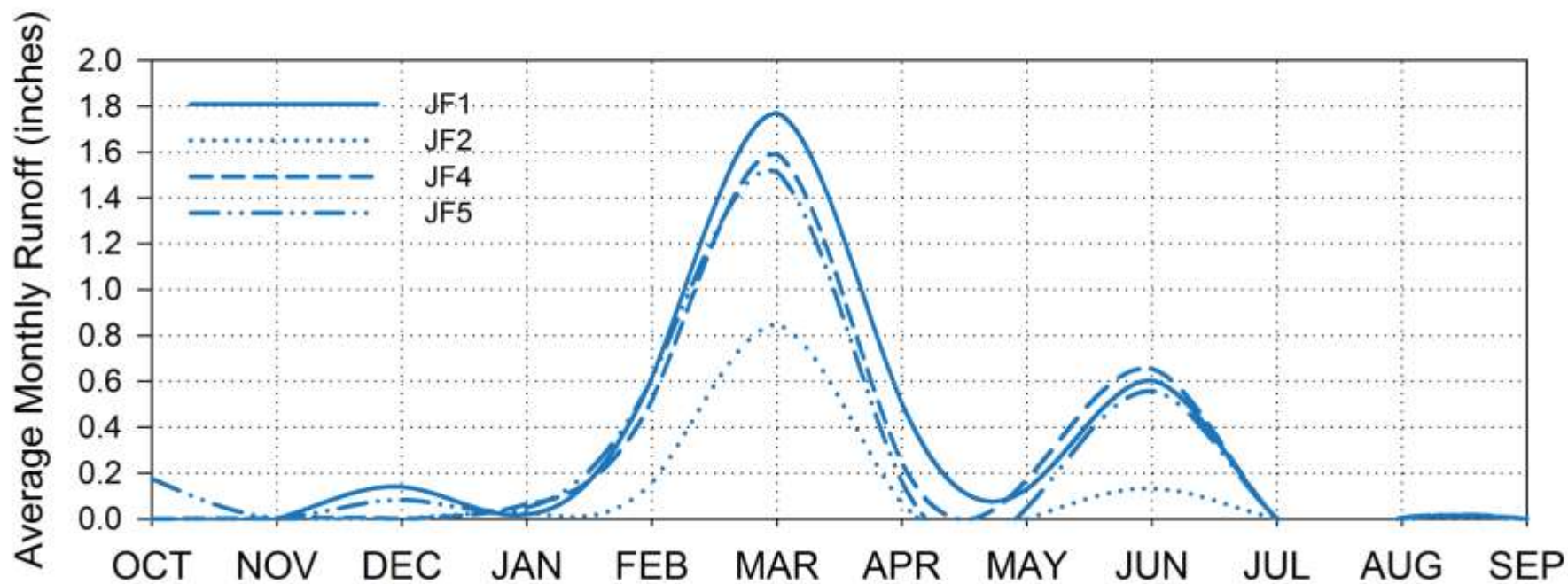


Edge-of-Field Management

- High Level of Management
- No-Till
- Grass Waterways
- Contour Strips

Site	Use	Tillage	Manure
1	Corn, alfalfa, hay	None	Surface apply, winter spreading
2	Permt. pasture, Hay pasture, Non-vegetated feedlot	Grazing Land	Solid beef manure deposited naturally
3	Wooded	None	None
4	Corn, alfalfa, hay, oats	Vertical tillage	Surface apply
5	Corn, alfalfa, hay	Chisel Plow, Field Cultivation	Incorporate
6	City		

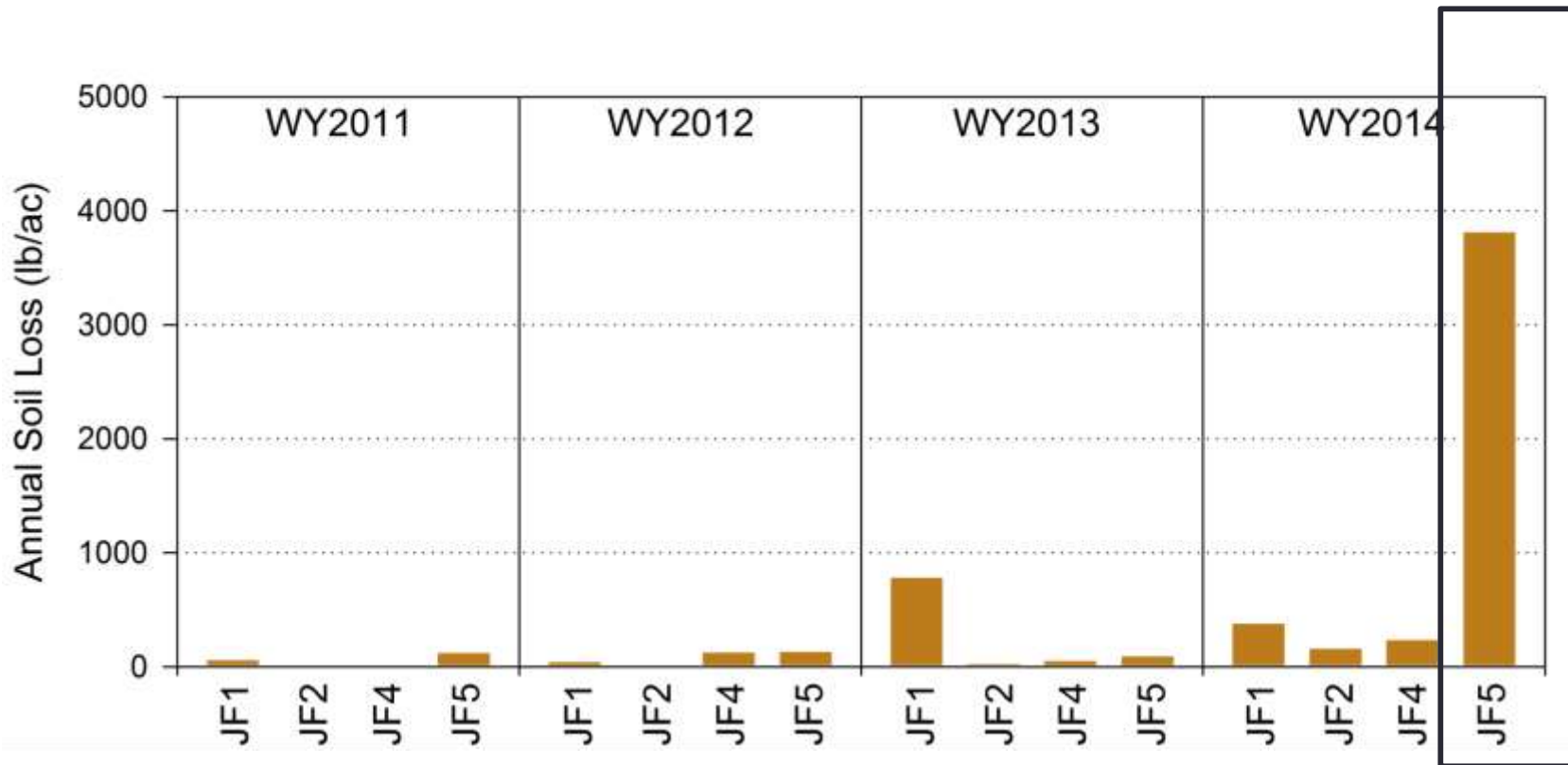
Runoff



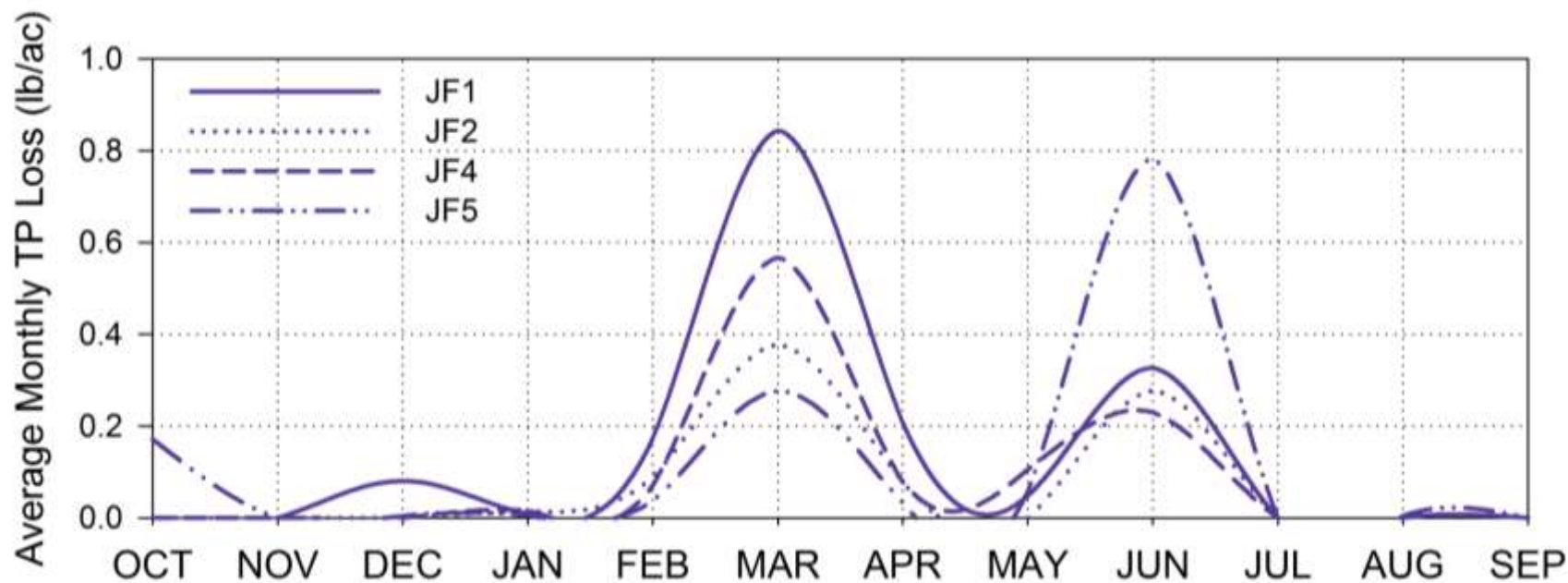
Management is above average
...but there is always room for
improvement...

		Four Year Average (lbs/acre)			
	State Average	Site 1	Site 2	Site 4	Site 5
Sediment	647	326	57	112	1046
P	1.6	1.7	0.8	1.1	1.4
N	6.1	8.9	3.2	5.4	7.0

Edge-of-Field Sediment Loss



Edge-of-Field P Loss



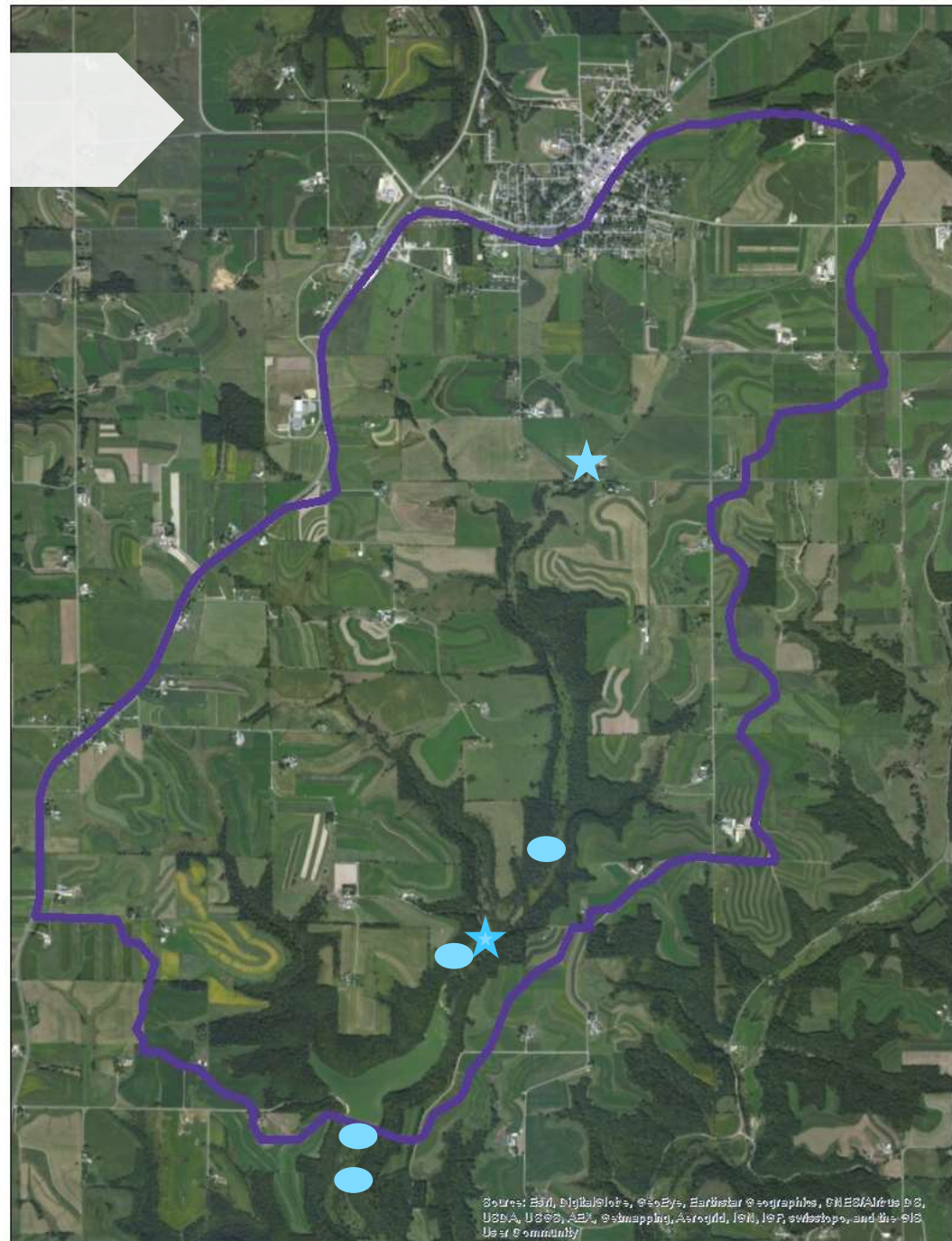
Phosphorus Loss (lbs/acre)				
	JF1	JF2	JF4	JF5
Average DP Loss	1.0	0.5	0.7	0.2
Average P Loss	1.7	0.8	1.1	1.4
% Loss Dissolved	60%	61%	64%	14%

Stream

2 in-stream sites

4 grab sample sites

P, N, temperature, stream flow, DO,
transparency, habitat assessment, **biotic
index**

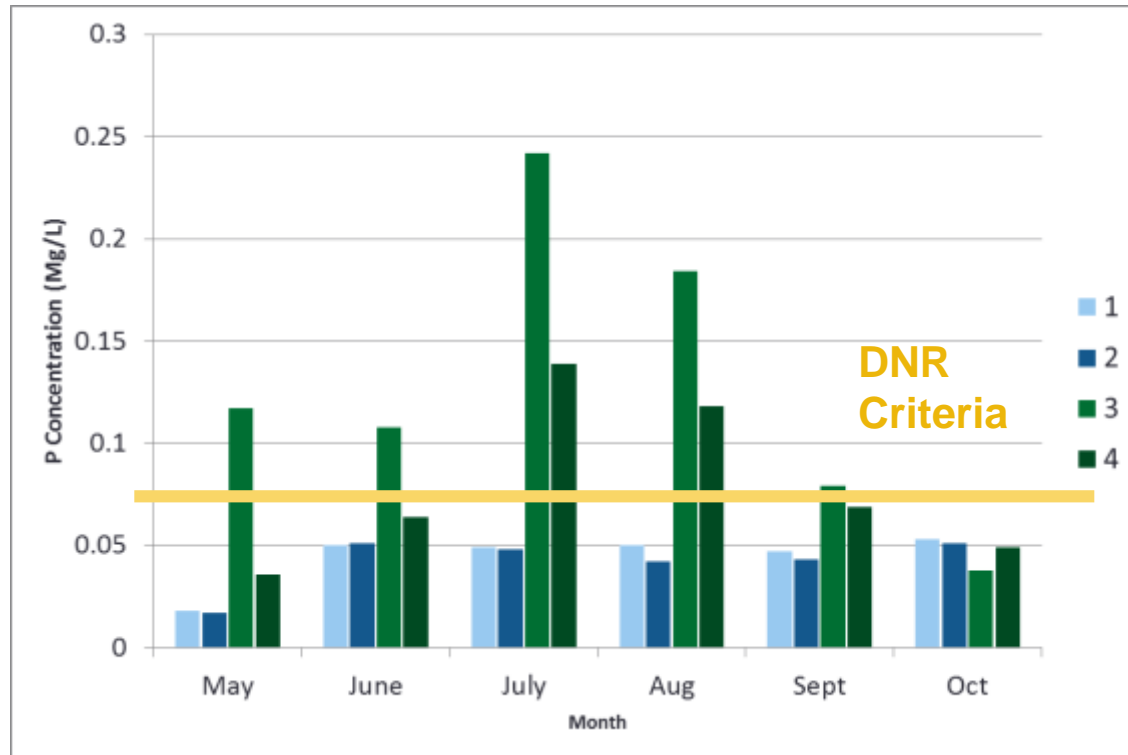


Stream Phosphorus Results

- DNR P criteria: P not to exceed 0.075 mg/L
- Median May- October daily mean concentrations permanent in-stream site ~0.057 mg/L (2011-2014)

2014 Grab Sample Results

	1	2	3	4
Phosphorus (mg/L) (WisCALM)	0.037	0.034	0.084	0.055
P Status	OK	OK	Exceeds	OK
Biotic Index (WAV)	Good	Fair	Poor	Fair



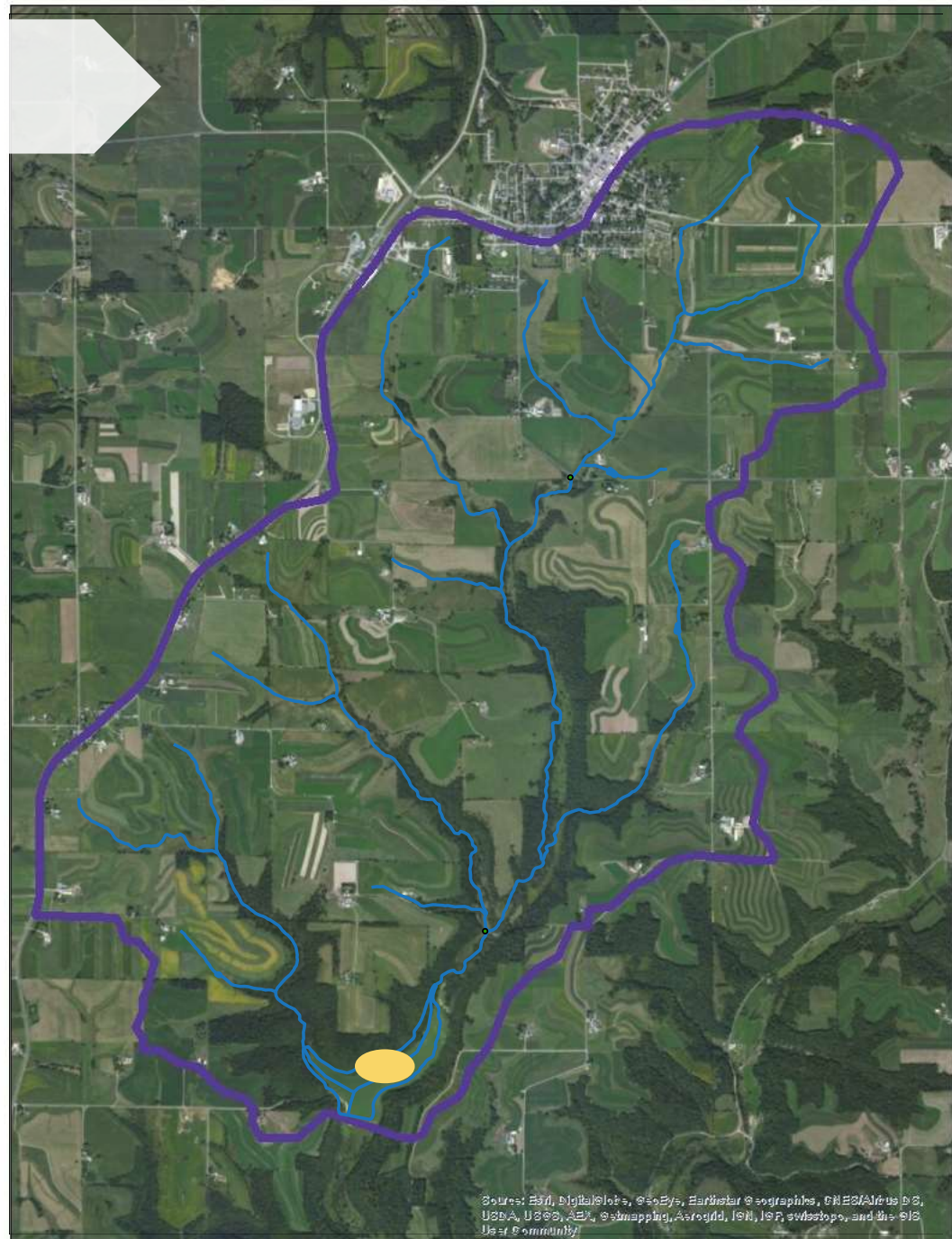
Edge-of-Field & Stream Conclusions

- High level of management
- Chronic losses aren't the issue
- Stream above the lake is not impaired
- Must maintain level of management



Lake

Total Phosphorus (surface & deep),
chlorophyll-a, color, clarity, dissolve
oxygen, Secchi disk depth

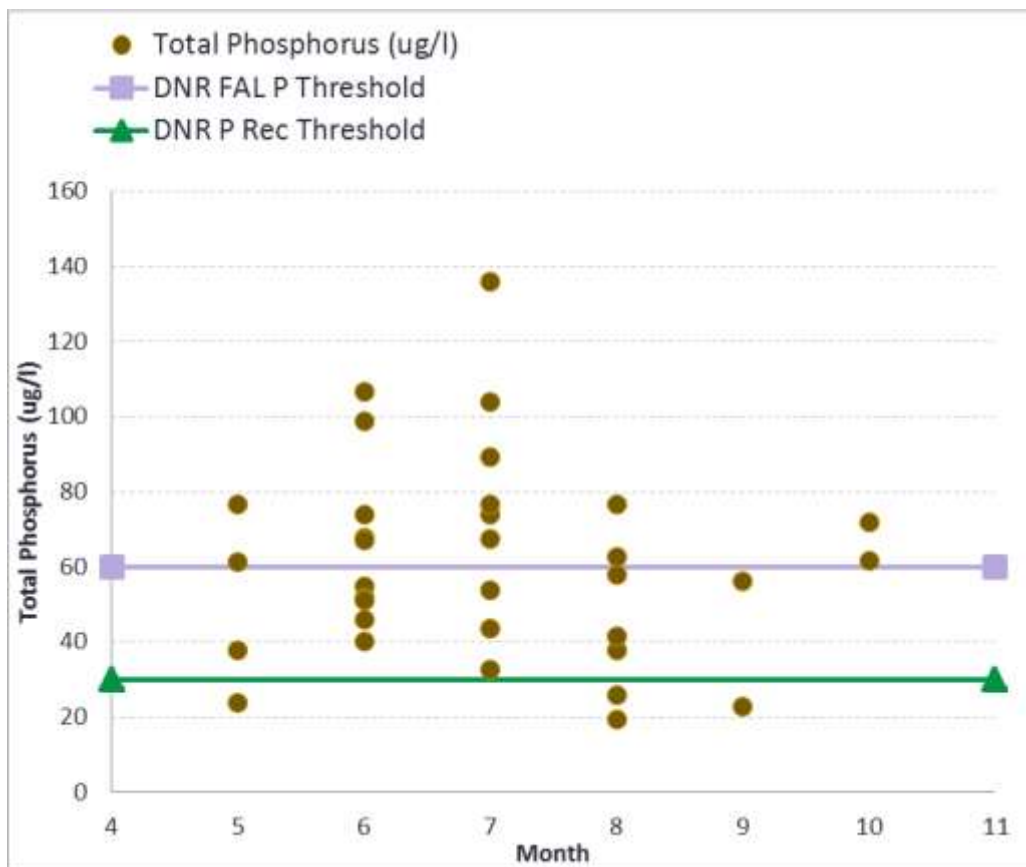
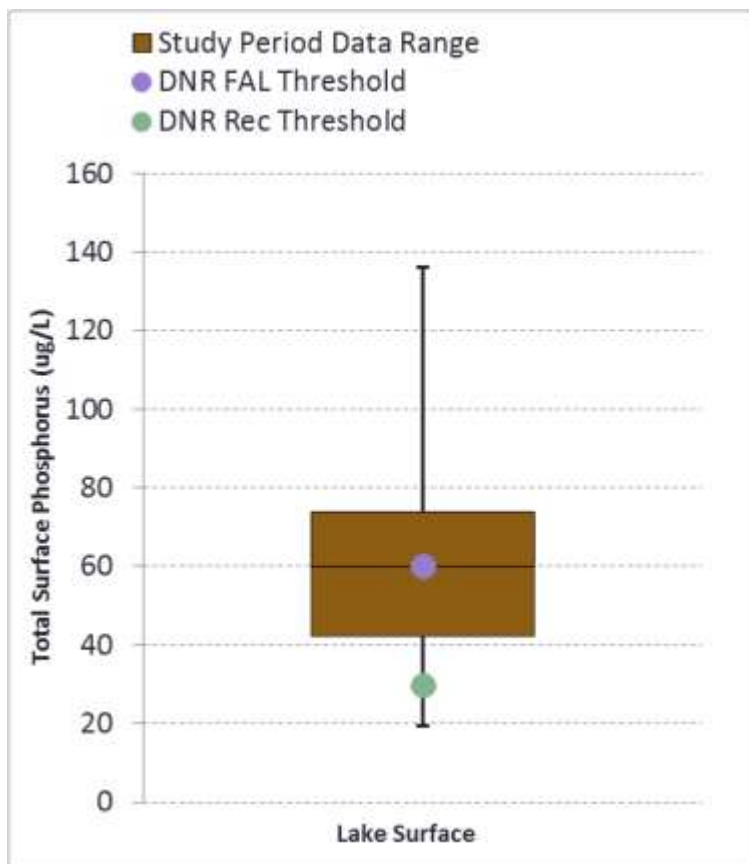


Lake Background

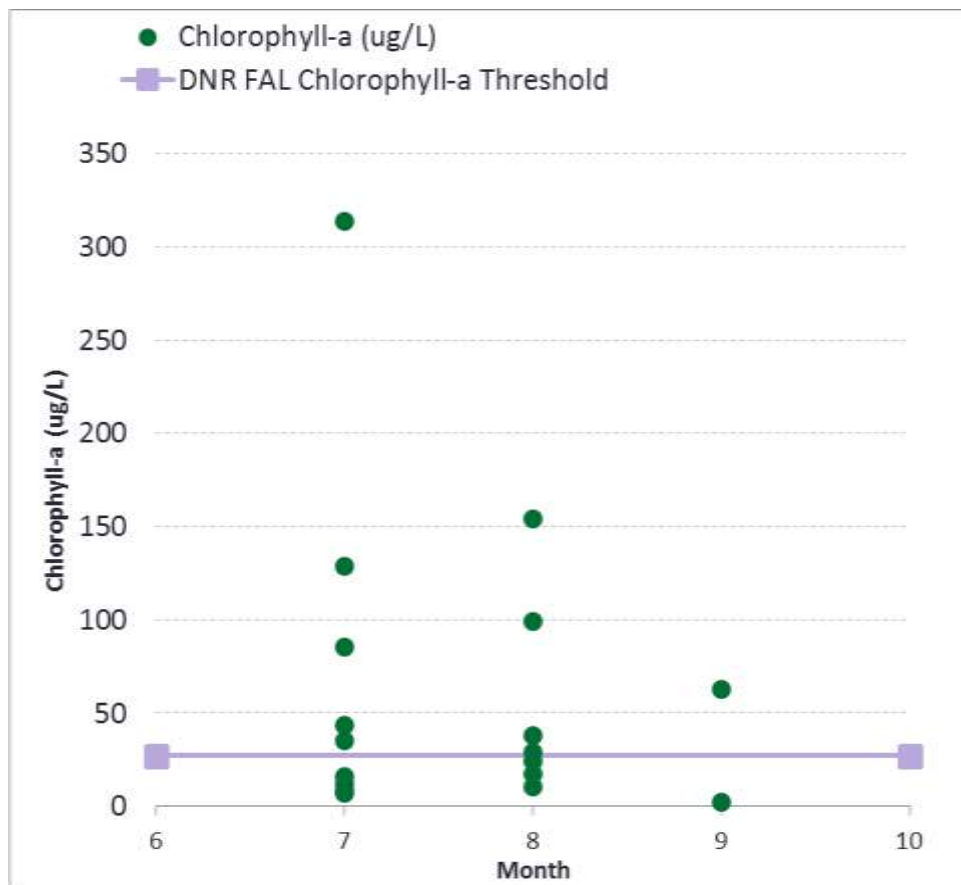
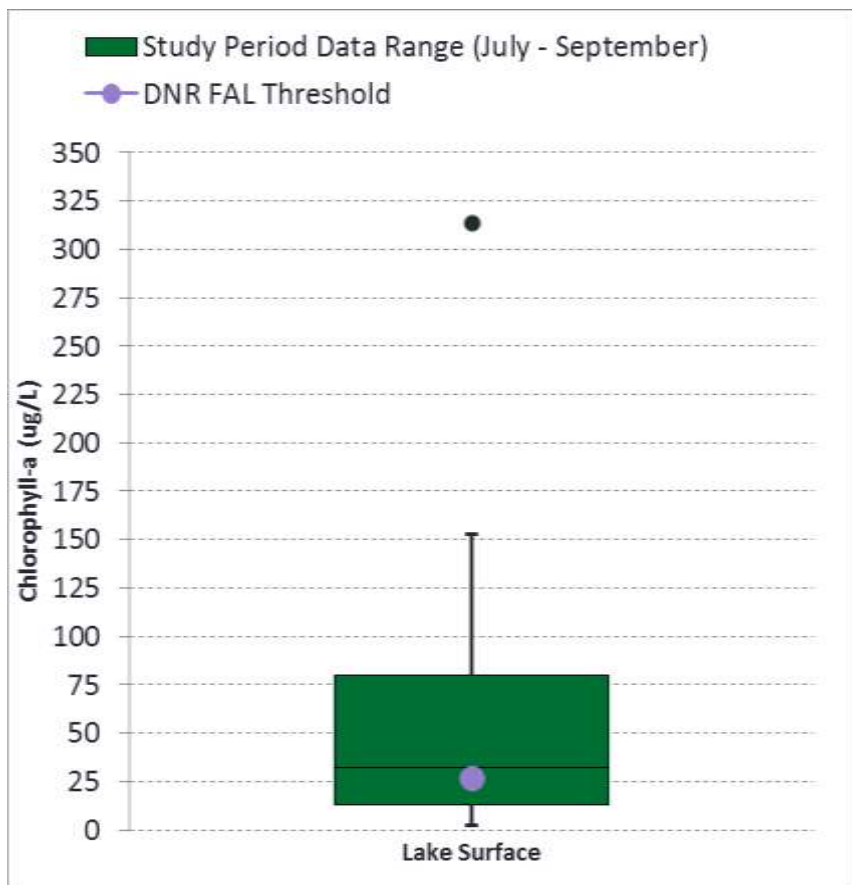


Deep Lowland Drainage Lake

Lake Results – Surface Phosphorus



Lake Results – Chlorophyll-a



Final Thoughts

Edge-of-Field

- Management overall working well
- Work to reduce dissolved phosphorus loss
- Reduce tillage in some areas
- Manage to prevent acute losses

Stream

- Not impaired
- Must maintain high level of farm management to avoid chronic loss

Lake

- General assessment: poor health
- Set water quality goals as a community of swimmers, farmers, and scientists
- Create reasonable expectations for use of the lake

What do we do when a stream is meeting standards but an impoundment lake below it is not?

Questions?

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