

# Is there a role for Geochemical Tools in the Clean Water Legacy?

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# What is the Clean Water Legacy?

- Legislative proposal to create a water program to address “Impaired” waters
- Impaired waters are waterbodies not meeting water quality standards
- The Federal Clean Water Act (CWA), Section 303(d) requires a Total Maximum Daily Load (TMDL) study
- What does impaired look like?

This would not be considered Impaired!



(AP PHOTO)

This would be considered Impaired!



# Why is the Legacy needed?

- The CWA requires states to test all (perceived) surface waters
- The MPCA estimates around ~10,000 waterbodies that are/will be unable to meet water quality standards
- If TMDLs are not completed, the CWA restricts any new or expanded pollutant discharges – **NO NEW GROWTH!**

# Who is behind the Legacy?

- Policy Work Group (G16)
- Broader Partners Group (G40)
- Broad citizen engagement
- Minnesota Environmental Initiative is managing and organizing the stakeholder process
- For more information go to:
- [www.mn-ei.org/policy/impairedwaters](http://www.mn-ei.org/policy/impairedwaters)

# How will the Legacy be funded?

- Tax or Fee?
- G16 examined 40 options and proposed:
- Fee on Municipal sewer (septic), single units = \$53.3M, (Hardship Exemptions)
- Multi-units = \$14.3M
- Tiered system for non-residential = \$12.7M ~\$75-to-80M annually

# Where do the funds Go?

- Monitoring and Assessment (M&A) = \$2M
- TMDL Studies = \$2M
- Non-point Source (NPS) Restoration and Protection = \$29M
- Point Source (PS) Restoration and Protection = \$38M
- Fee Administration = \$ 4M



# What do these categories mean?

- M&A is for the testing of waterbodies
- TMDL Studies is for CSI (investigations)
- NPS – watershed BMPs
- PS – wastewater treatment upgrades
- (No new dams)

Should this Lake meet WQS?



**Not if it's a Corn Field in August**



Is this Impaired Waterbody SW or GW?



# TMDL studies demand understanding of pathway and process

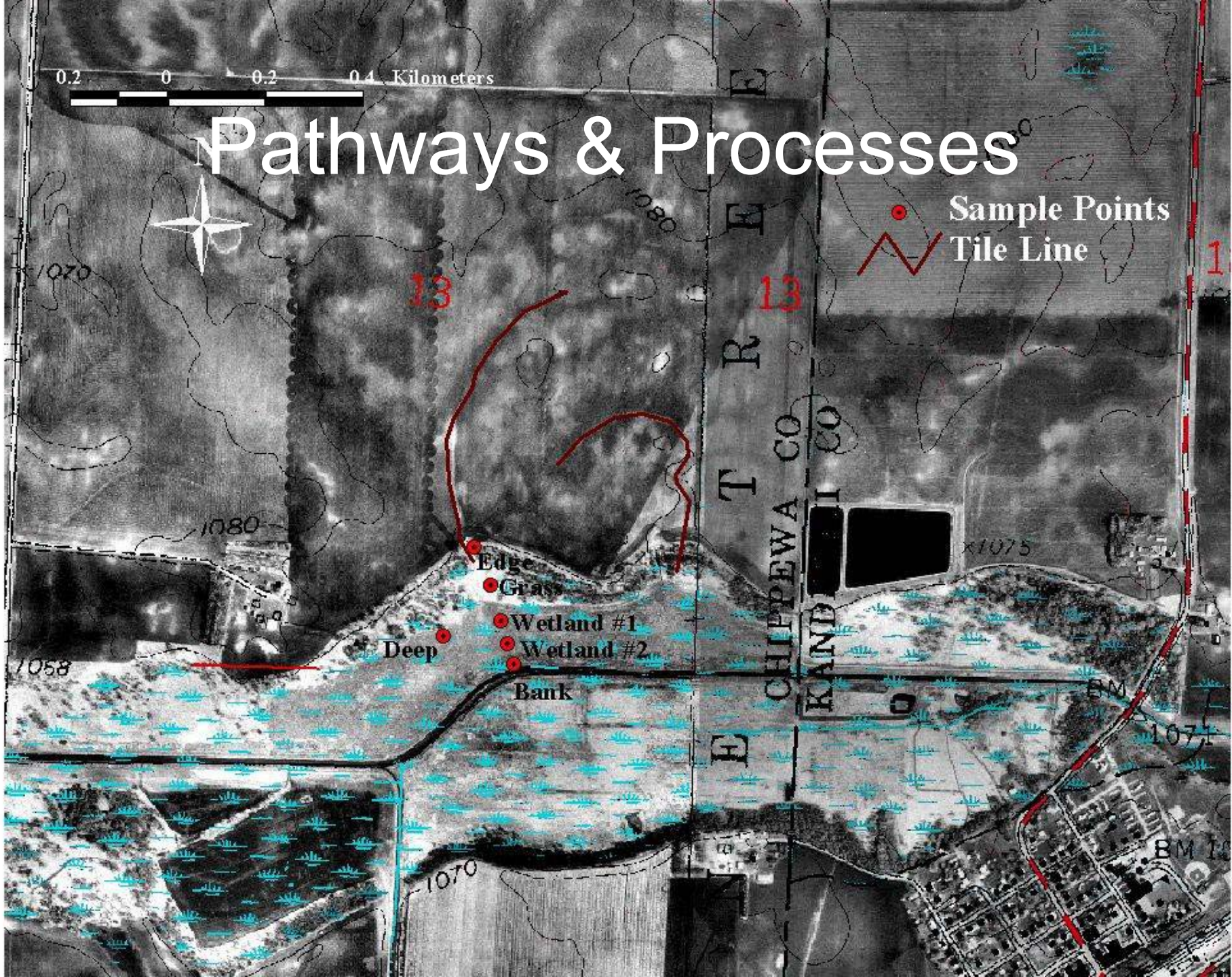


0.2 0 0.2 0.4 Kilometers

# Pathways & Processes



● Sample Points  
~ Tile Line



13

13

Deep

Edge

Grass

Wetland #1

Wetland #2

Bank

T R

C H I P P E W A C O  
K A N D I I C O

x1075

1070

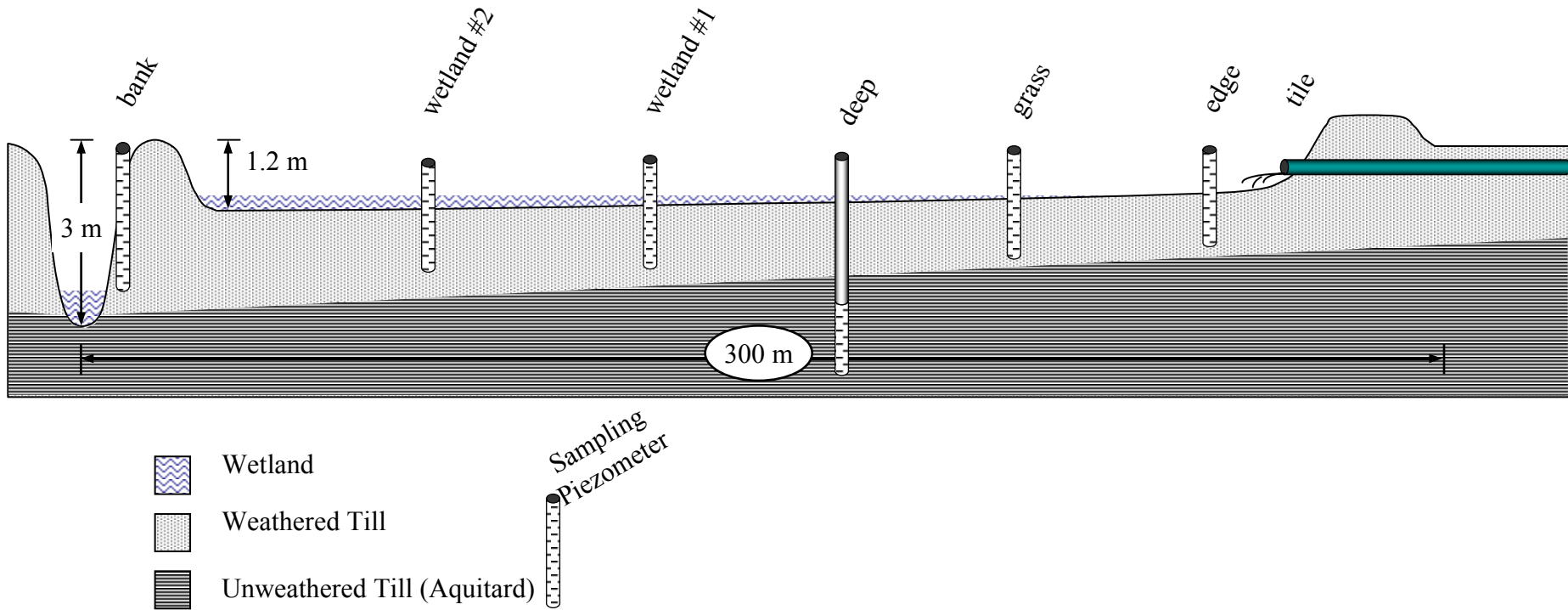
1075

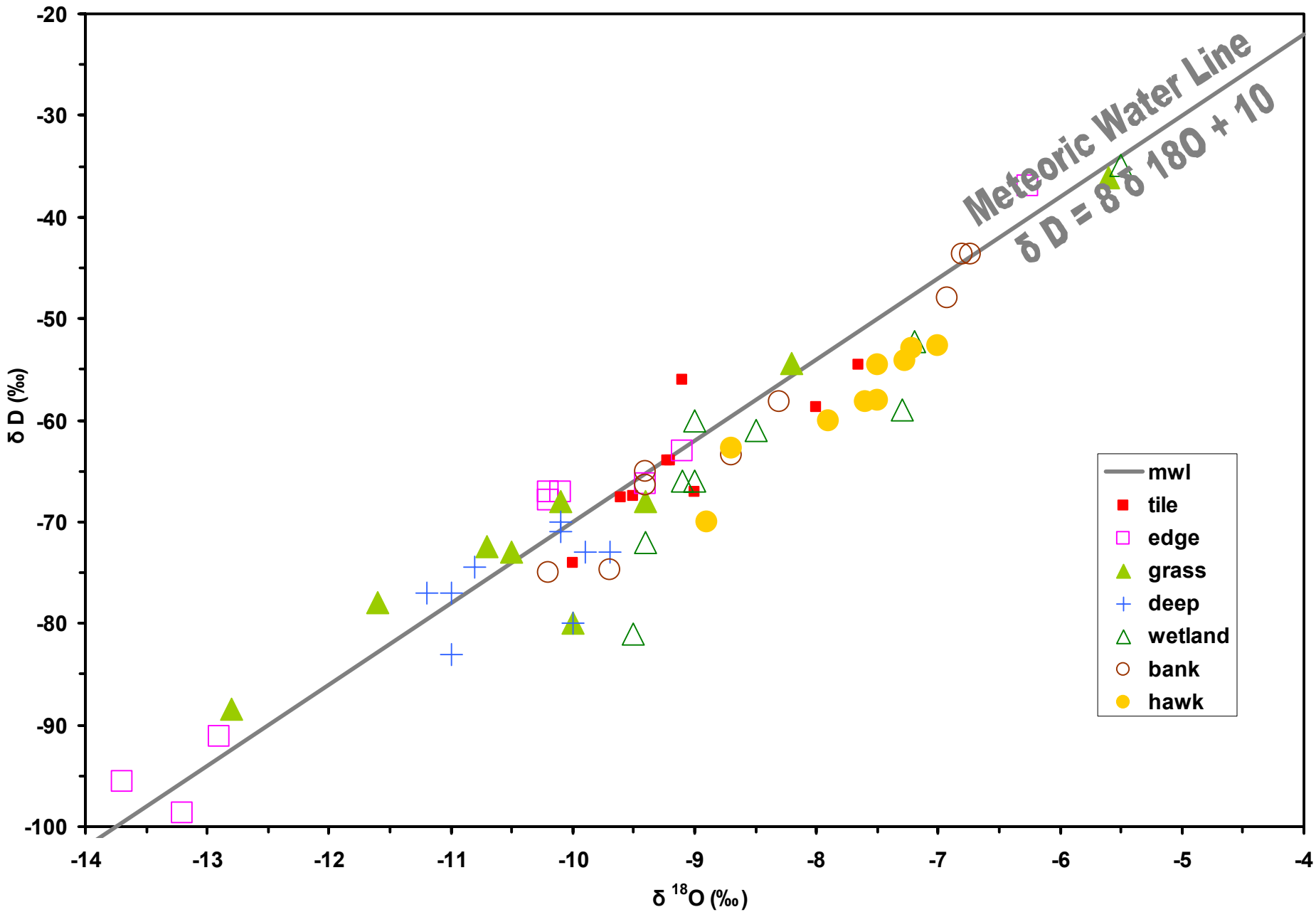
BM 1

1

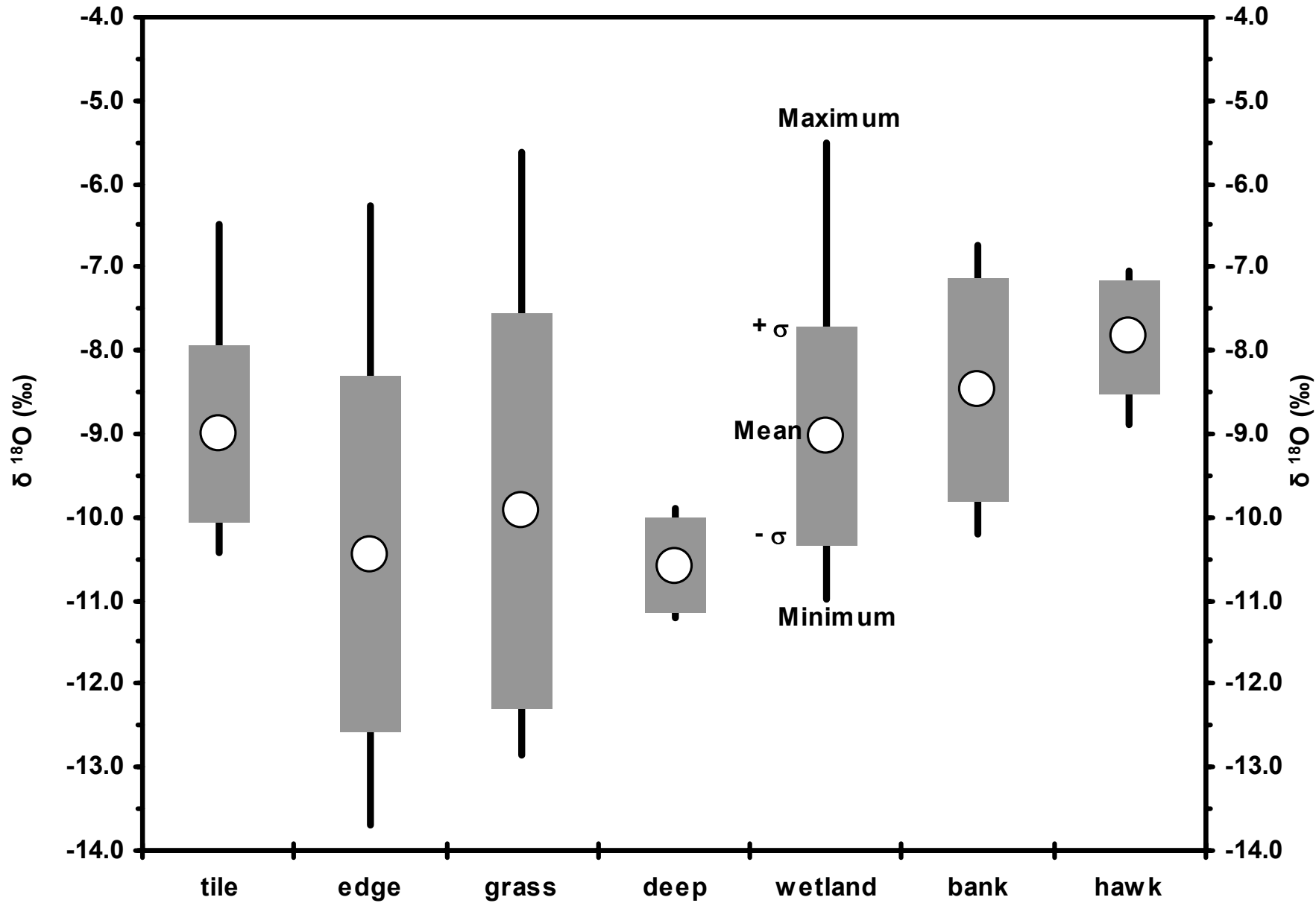
# Multiple SW & GW Exchange

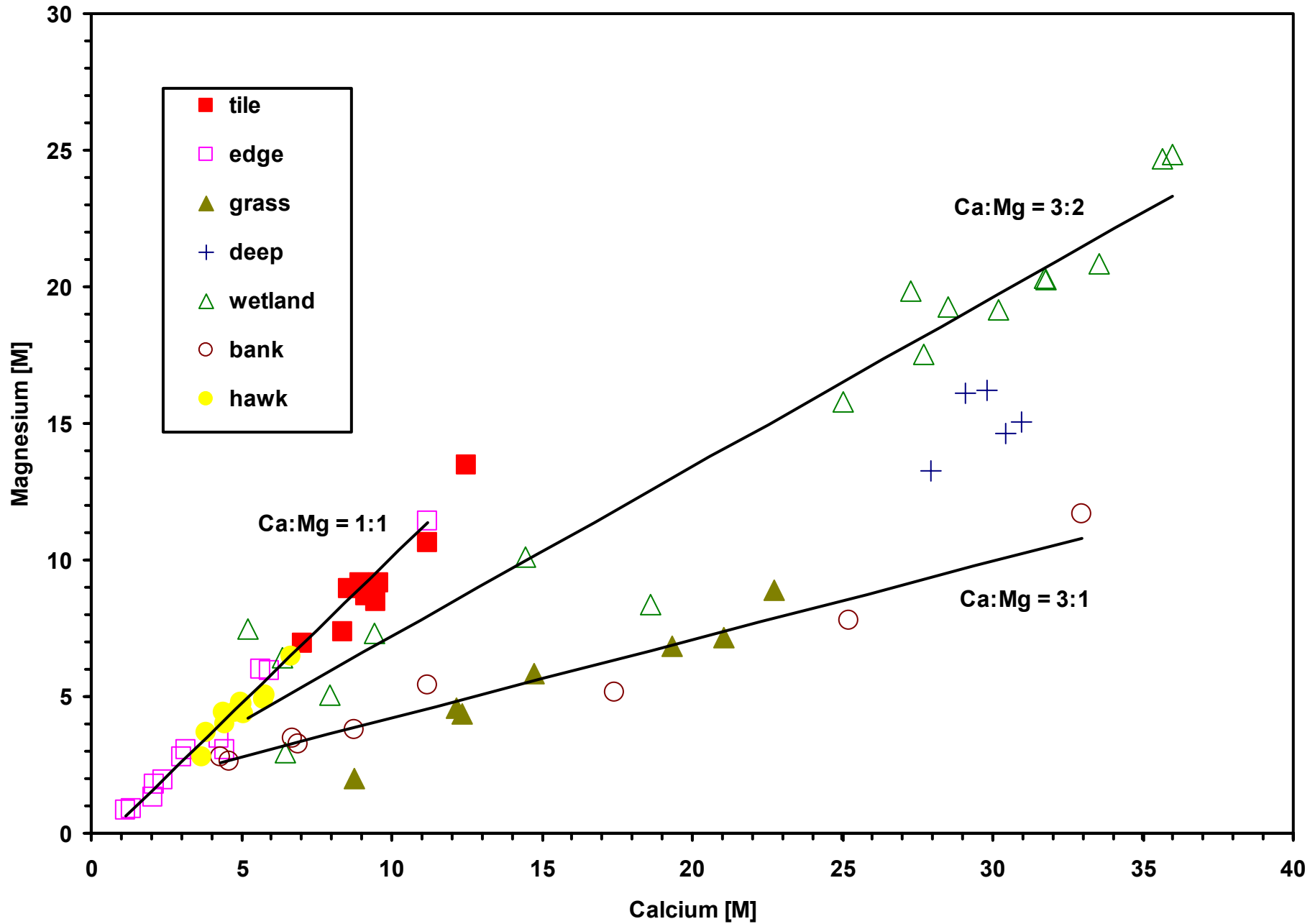
Figure 2b Cross-section of Knott's wetland (not to scale).

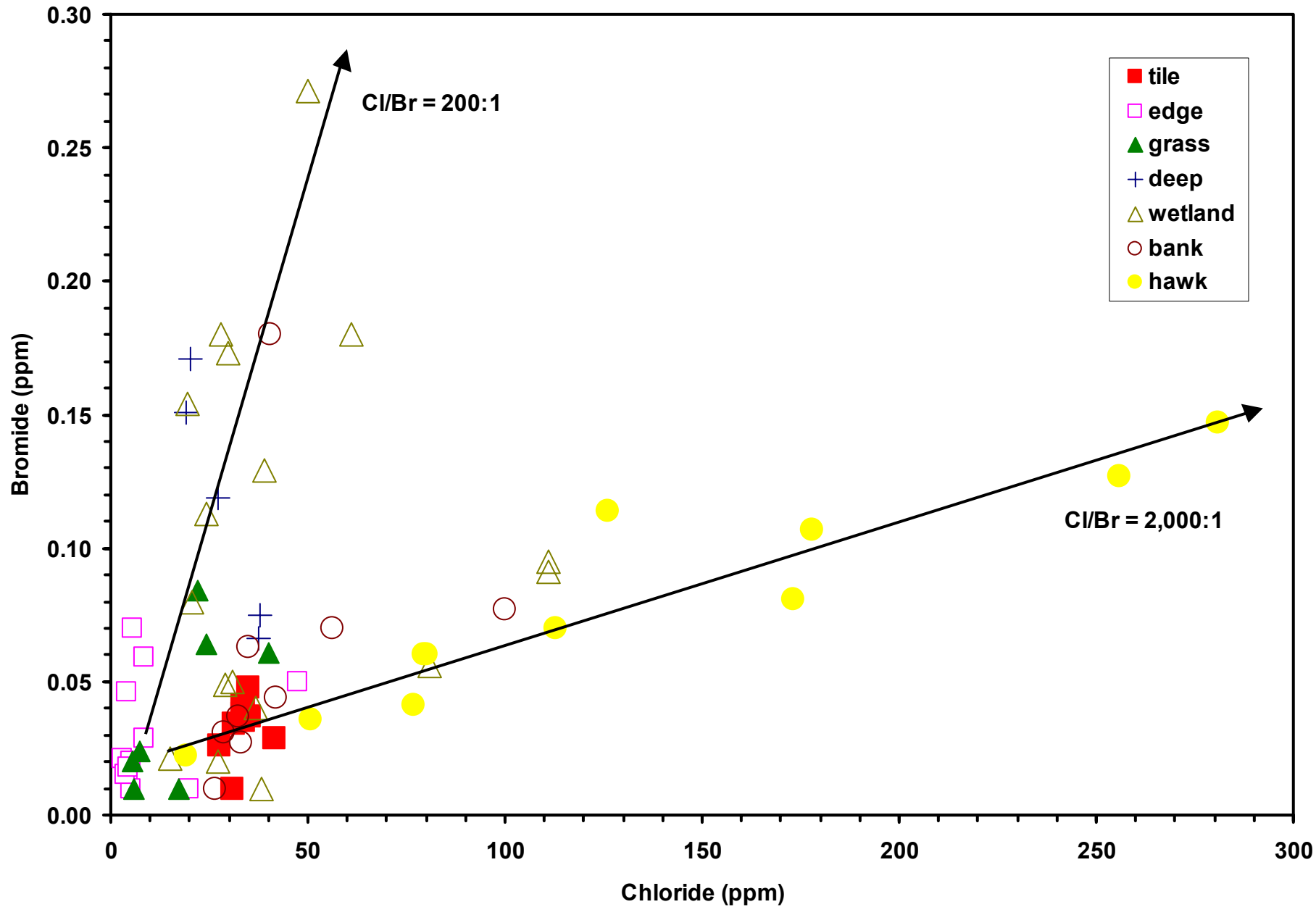












# Turbidity

- Just a runoff problem?

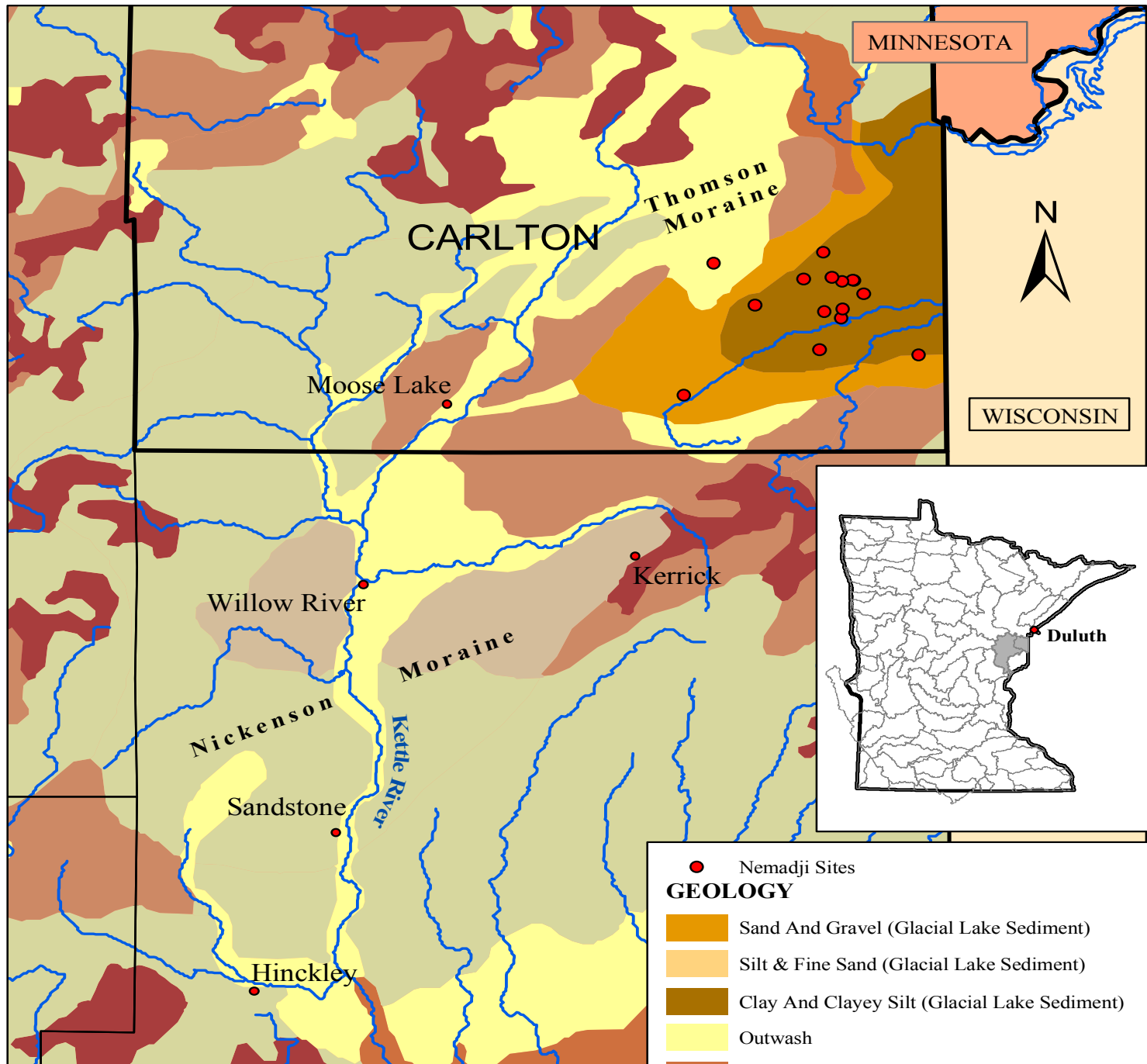




Not Where “Conduits Rule”

Year-round Turbidity in Deer Creek

Figure 1, Quaternary Geology



# Litchfield WWTP & Jewitt's Creek



figure 1, Jewetts Creek and Grove Creek (reference site)

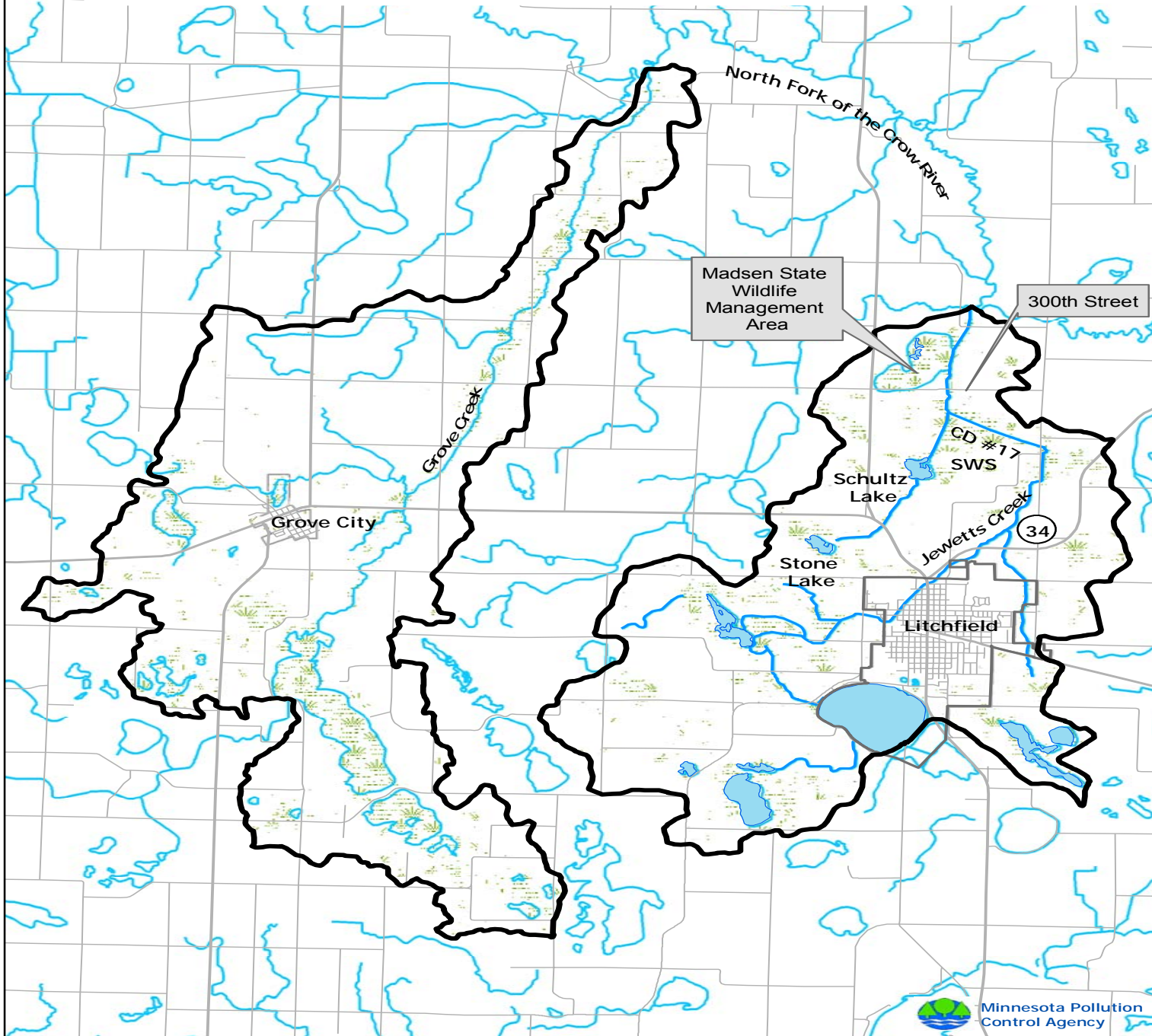
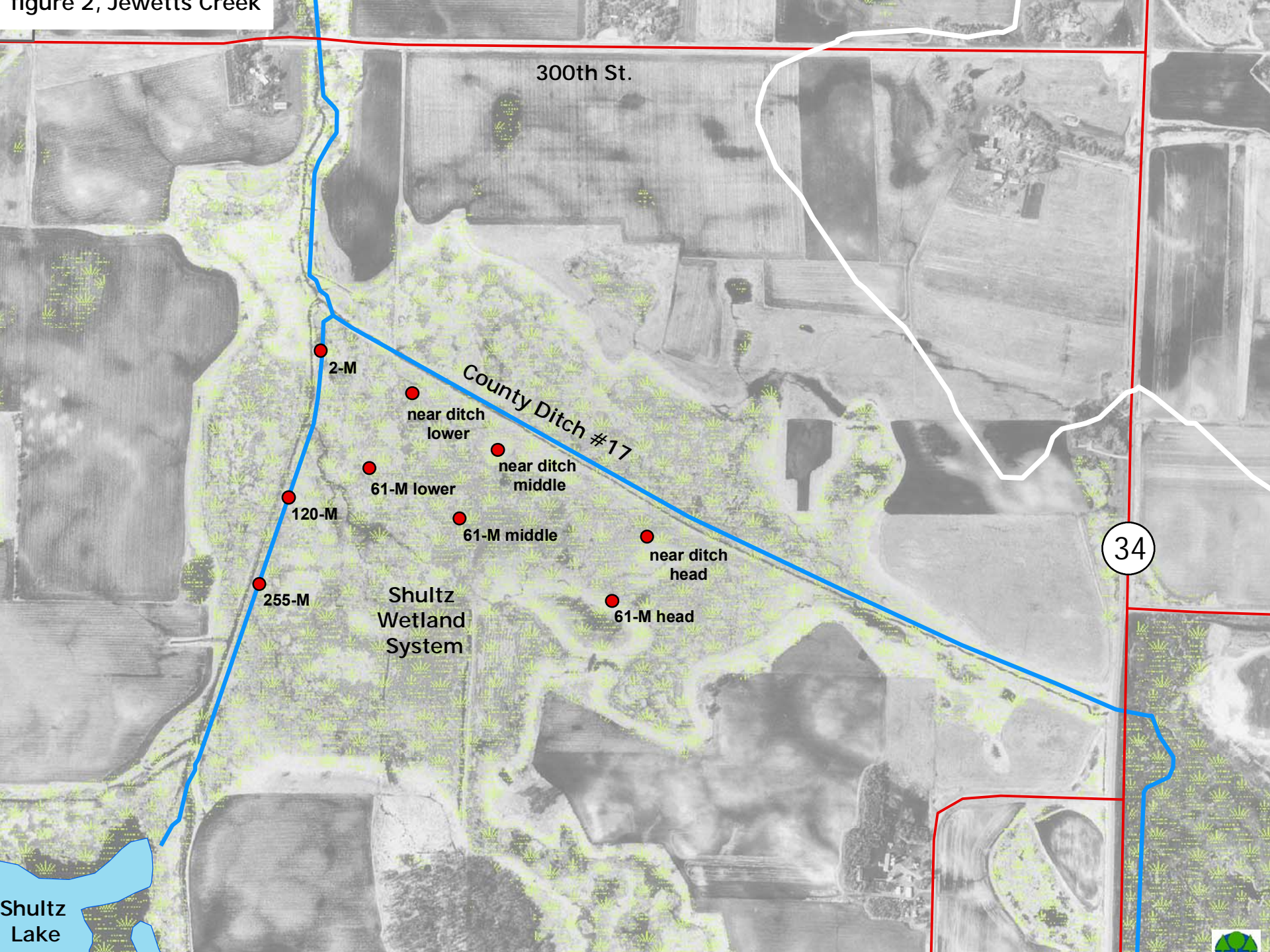
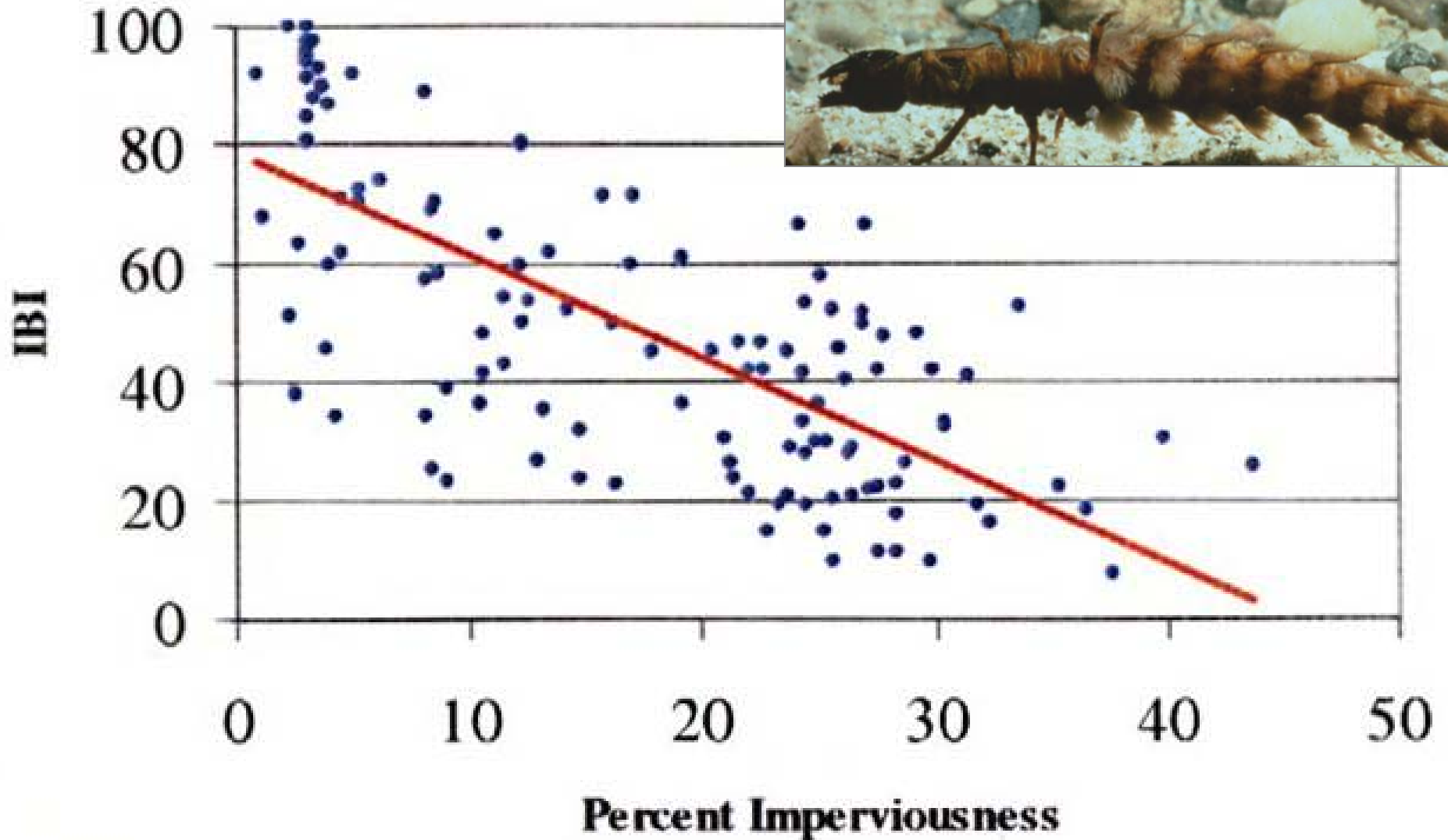




Figure 2, Jewetts Creek



# Surface Type



# Development Thresholds?



What will it take to restore Lake Pepin?



# Stop Stream Bank Erosion?



10.11.2005

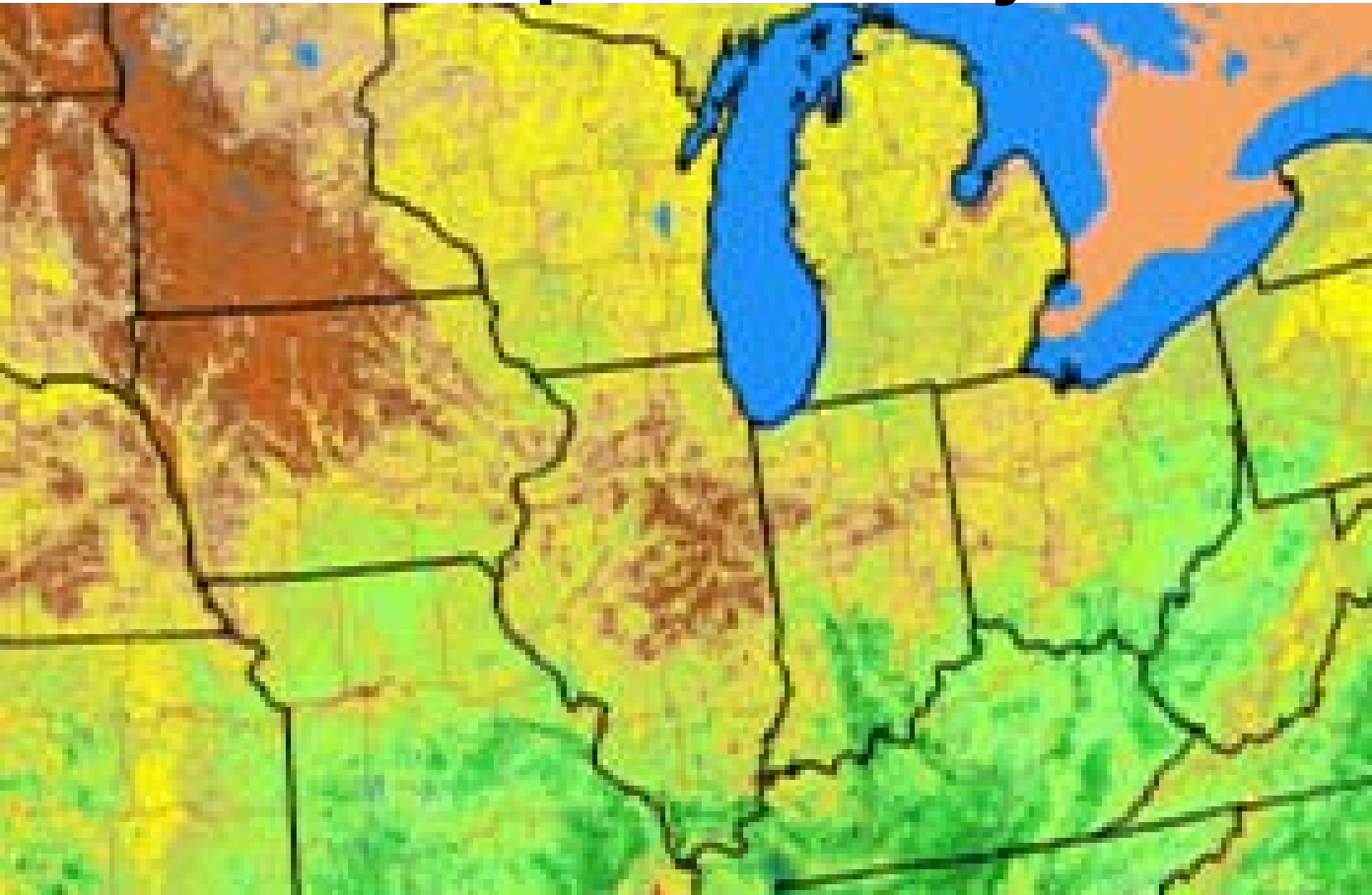
Remove Nutrients from the GW?



# In-line Phytoremediation?

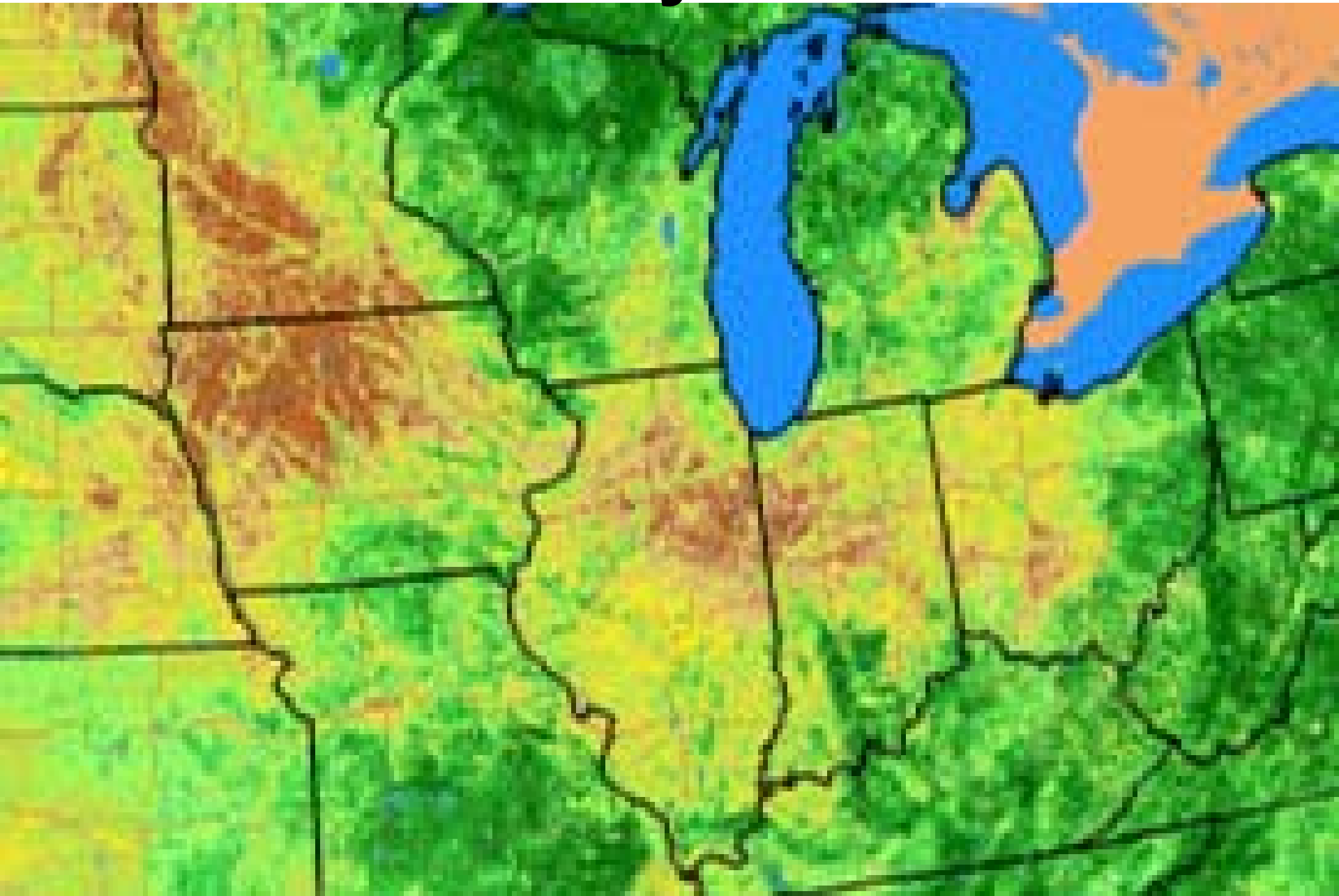


**2003 April 20 – May 3**

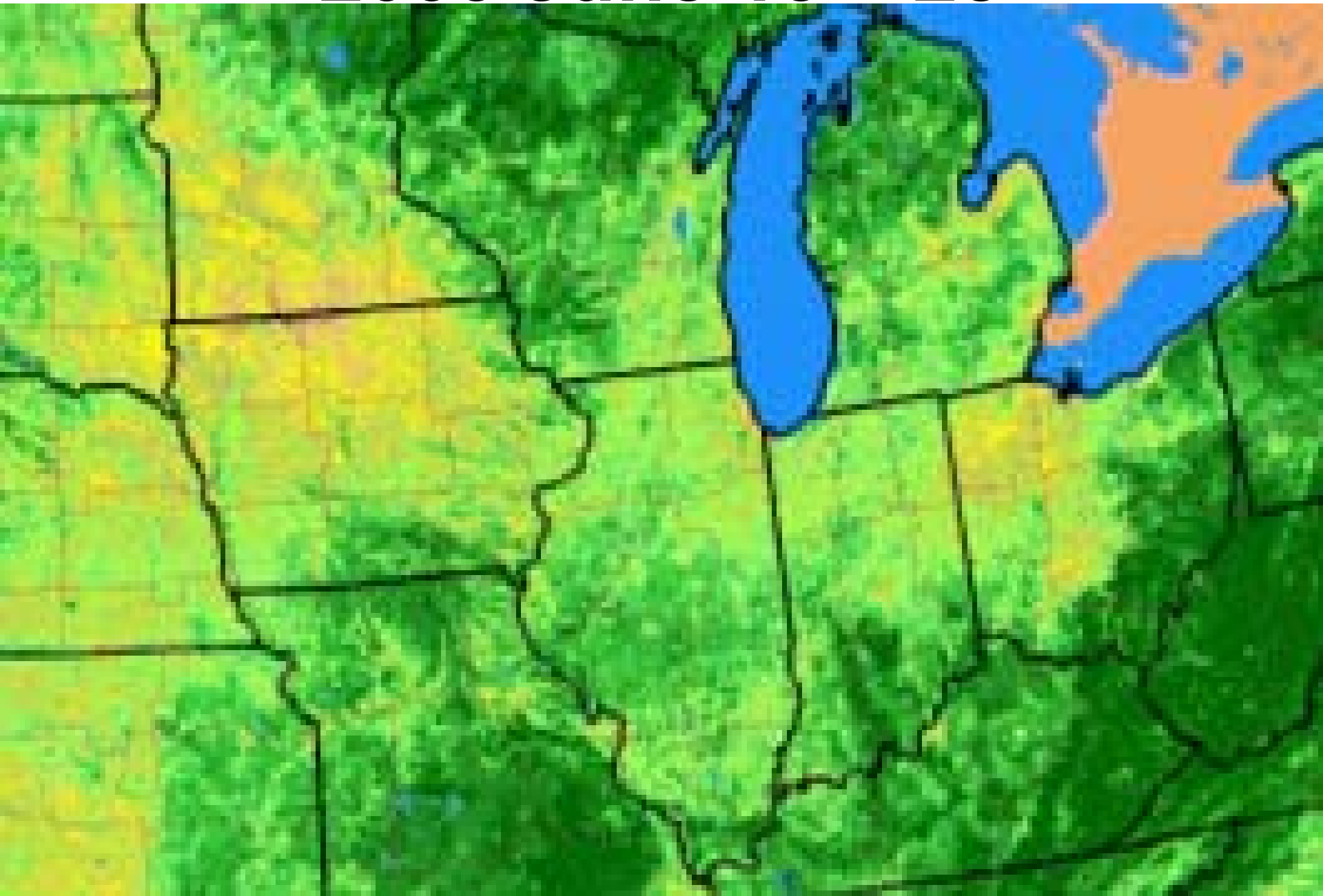




**2003 May 18 – 31**



**2003 June 15 – 28**



# Summary

- We have WQ challenges in Minnesota
- CWA is driving us toward action
- Federal funds are stretched thin
- We need a Legacy fund to study and restore impaired waters
- Geochemical tools will be needed to solve the pathway-process mystery.