Informational Meeting

Two Rivers Lake/County Ditch 28 Area

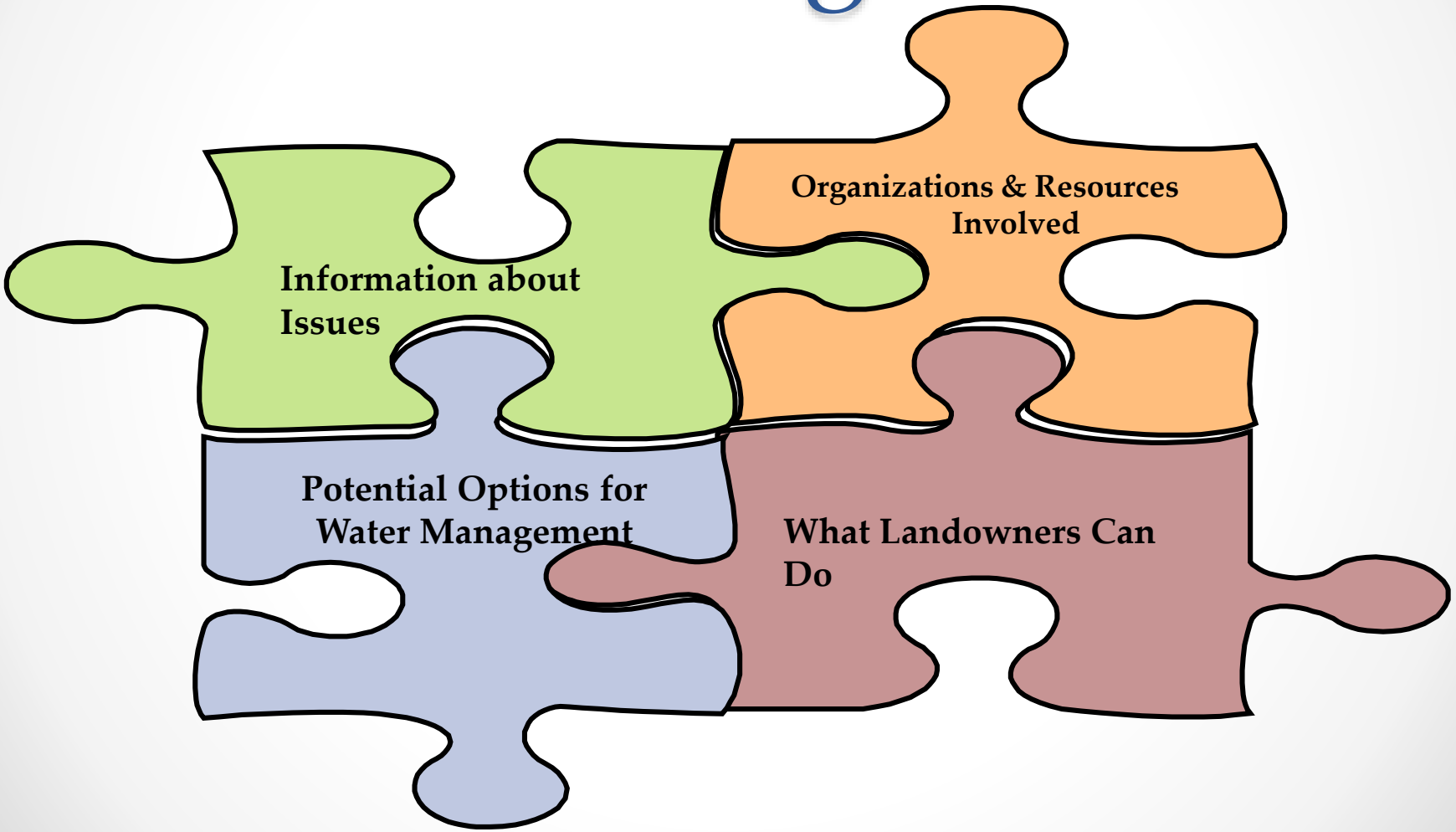
WELCOME

Donna Rae Scheffert

- The role of the facilitator is to make this informational meeting **productive** and **keep us on time**

- We are happy to hear from you, and look forward to **your questions** following the briefings from resource people

Goal: Putting Some Pieces Together



Expectations

Respect the agenda and agreements about time

60 minutes for information sharing, 20 minutes for Q & A

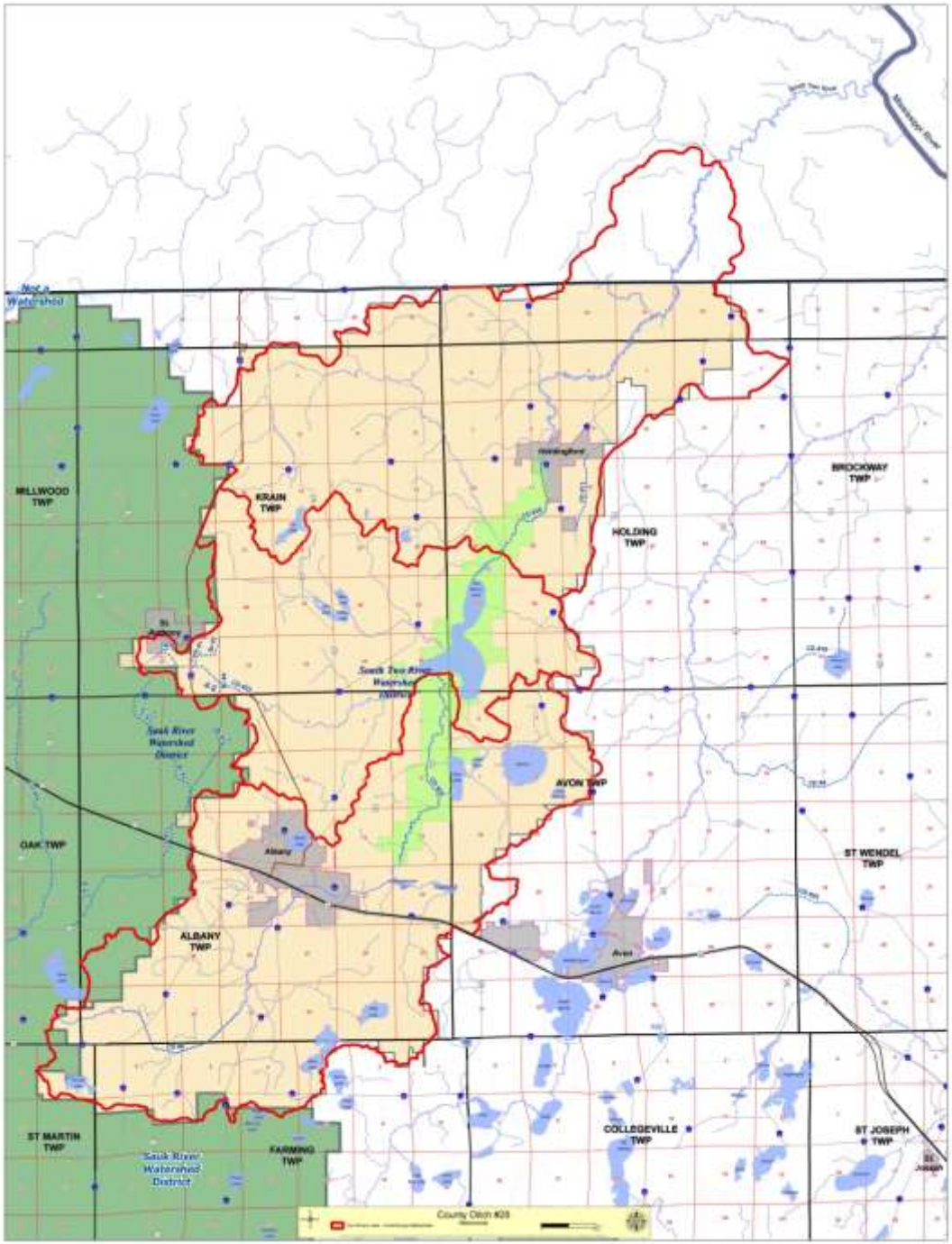
Avoid one-on-one side meetings or conversations

Or it can be difficult for everyone to hear the speakers

During Q & A, there is time to ask questions but not give speeches We want to hear from as many people and answer as many questions as possible

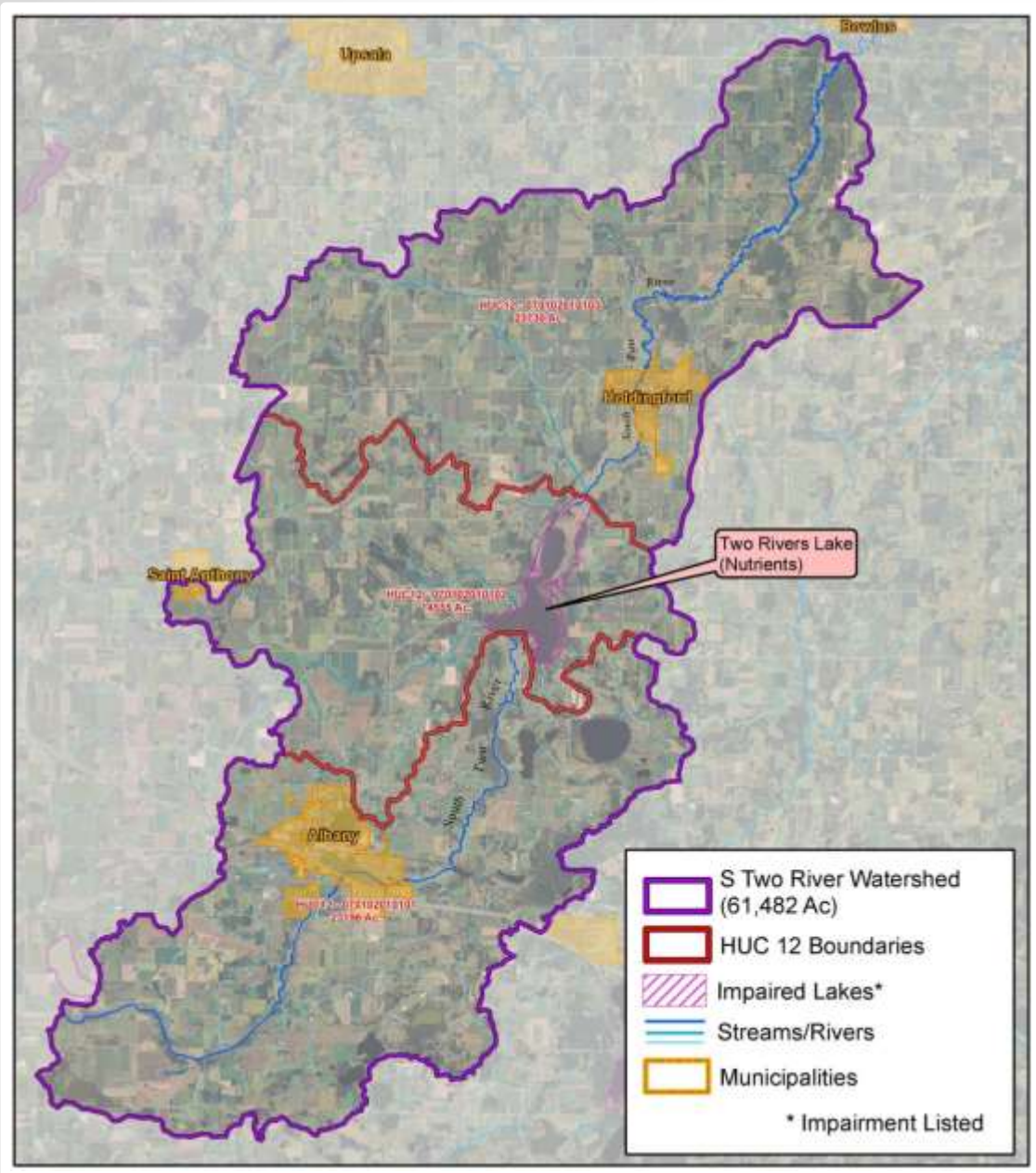
Focus on the issue and not on people

Keep it civil as we have to work together on our issue



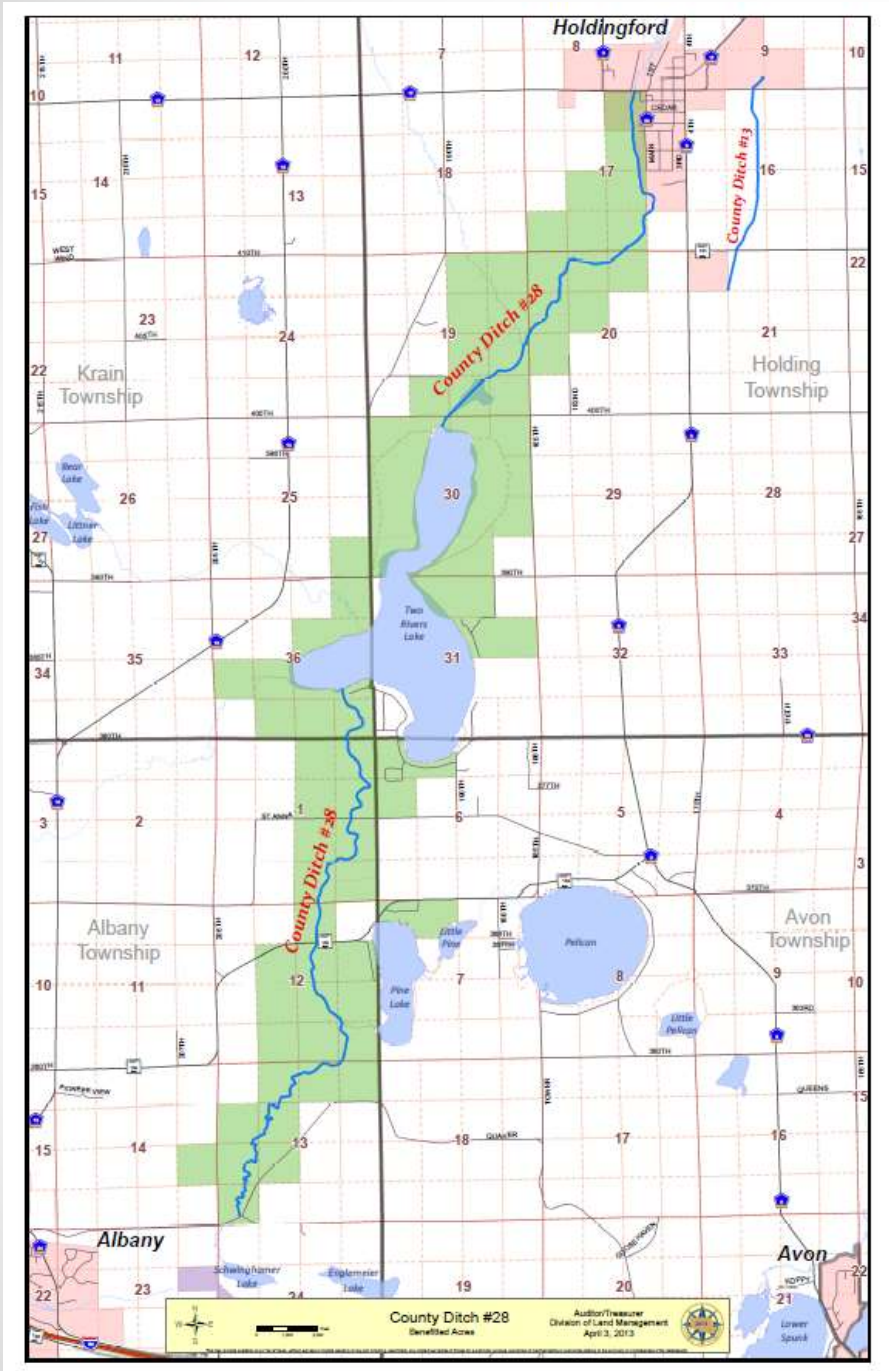
South Two Rivers Watershed

- Cities of Albany, St. Anthony, Holdingford
- Interstate 94 bisects southern portion of watershed
- The South Two River flows from the southwest to the northeast toward the Mississippi River.



South Two Rivers Watershed

- The South Two River is 29.3 miles long
- 116 Miles of additional streams and public ditches
- Many more miles of private ditching
- Two Rivers Lake
  - Impaired for nutrients
  - Lakeshore owners dealing with flooding



County Ditch #28

- County Ditch 28 was established around 1906 for agricultural drainage purposes from the channel of the South Two River.
- Flows from the southwest at Quaker Rd to the northeast at CSAH 17 in the City of Holdingford.
- 234 Parcels in Benefitted Acreage
- 127 Parcels on Two Rivers Lake
- 65 Parcels on Two Rivers Lake in Benefitted Acreage
- Not all parcels on Lake are within Benefitted Ac

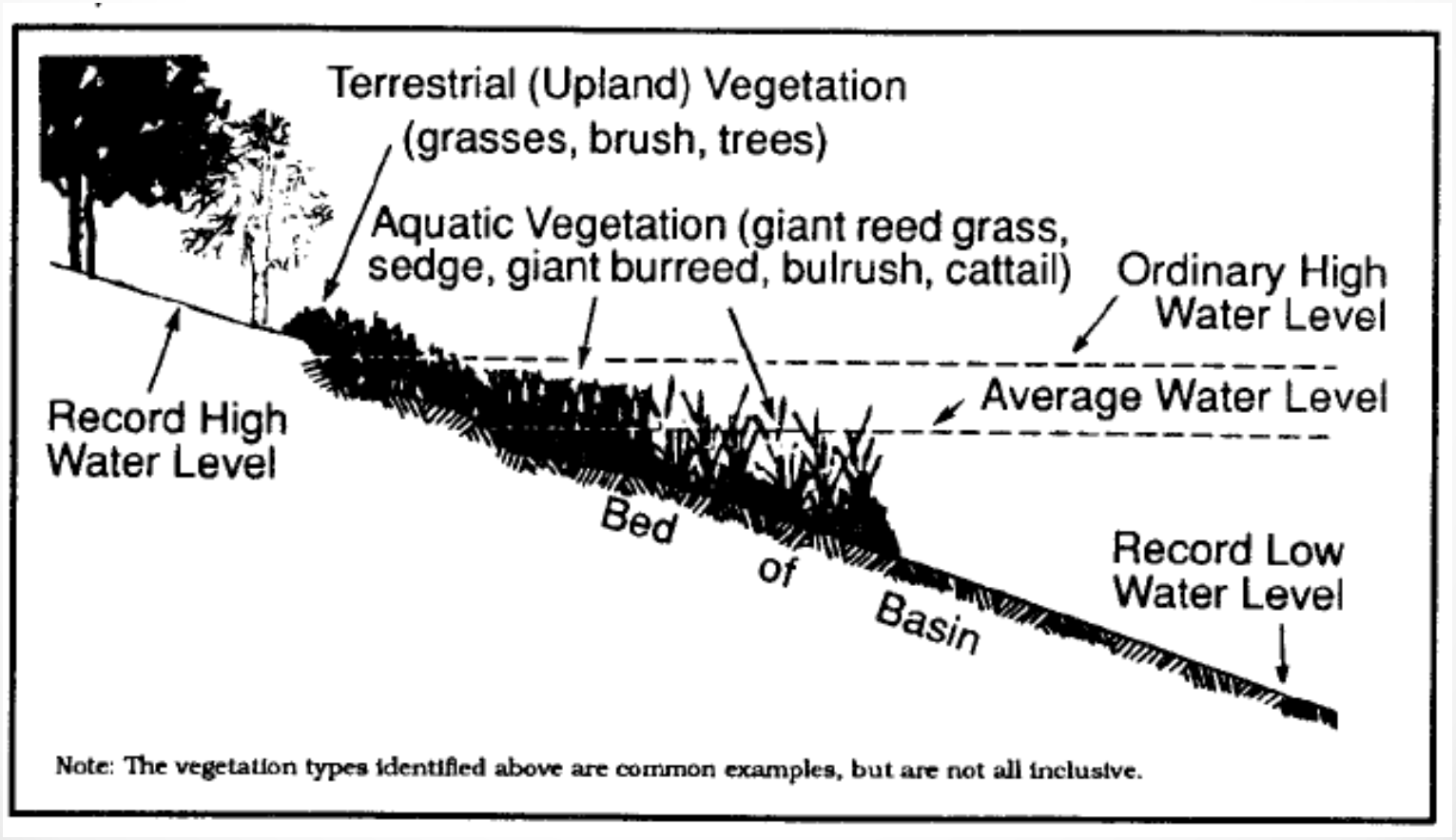
Division of Ecological and Water Resources
(an integration of the former Divisions of Waters and Ecological Resources)

Water Resource Core Areas

- Public Waters Protection
- Water Supply Management
- Information for Decision-Making

Glossary Terms Review

DNR Jurisdiction – Ordinary High Water (OHW) Level



Ordinary High Water (OHW) Level

For lakes and wetlands, the OHW is the highest water level which has been maintained for a sufficient period of time to leave evidence upon the landscape.

RUNOUT

The Runout is the elevation at which a basin begins to outflow.

1% Chance Flood (100 Yr)

This flood elevation refers to the level that flood waters might reach or exceed in a flood that has a 1-percent chance of occurrence in any given year. (Used for floodplain regulation)

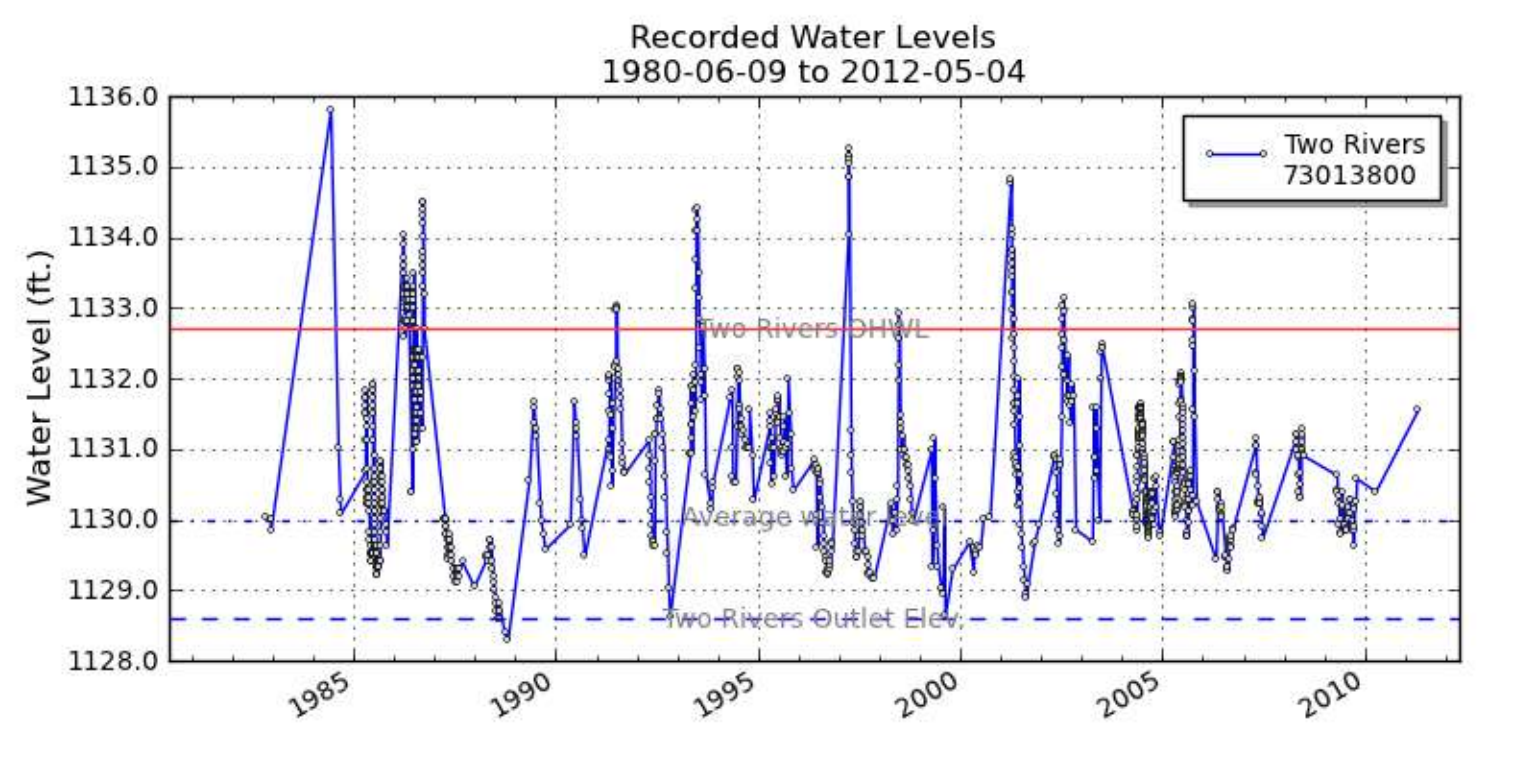
WATERSHED

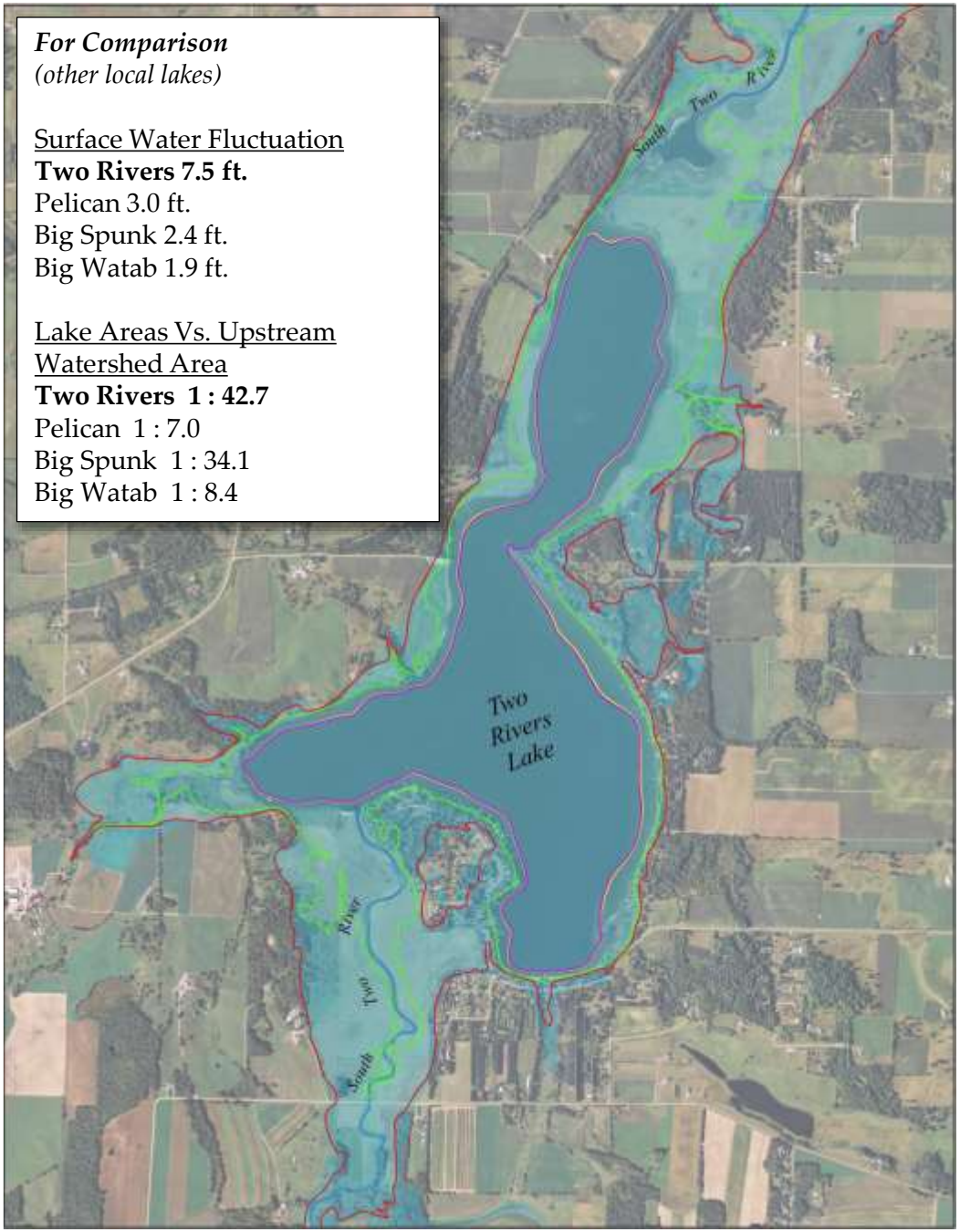
A watershed is the area of land where all of the water that drains off of it goes into the same place—a river, stream or lake.

Average Annual Precipitation

- State of MN: 25.6”
- Stearns County : 27.9”
- Watershed to Lake Ratio is 43:1 (32,245:756 acres)
- Precipitation Data (1980 – Present): 84% at or above State Average

Two Rivers Lake levels





For Comparison
(other local lakes)

Surface Water Fluctuation
Two Rivers 7.5 ft.
Pelican 3.0 ft.
Big Spunk 2.4 ft.
Big Watab 1.9 ft.

Lake Areas Vs. Upstream Watershed Area
Two Rivers 1 : 42.7
Pelican 1 : 7.0
Big Spunk 1 : 34.1
Big Watab 1 : 8.4

Two Rivers Water Levels

- Ordinary High Water Level
  1133.25
  Green Line
- Lowest Recorded Level
  1128.85
  Purple Line - 1988
- Run Out Level
  1129.15
  Yellow Line
- Highest Recorded Level
  1136.35
  Red Line - 1984
- 100 Yr Floodplan
  (FEMA FIRM)
- Large Contributing Watershed
- 7.51 ft. of surface water fluctuation!

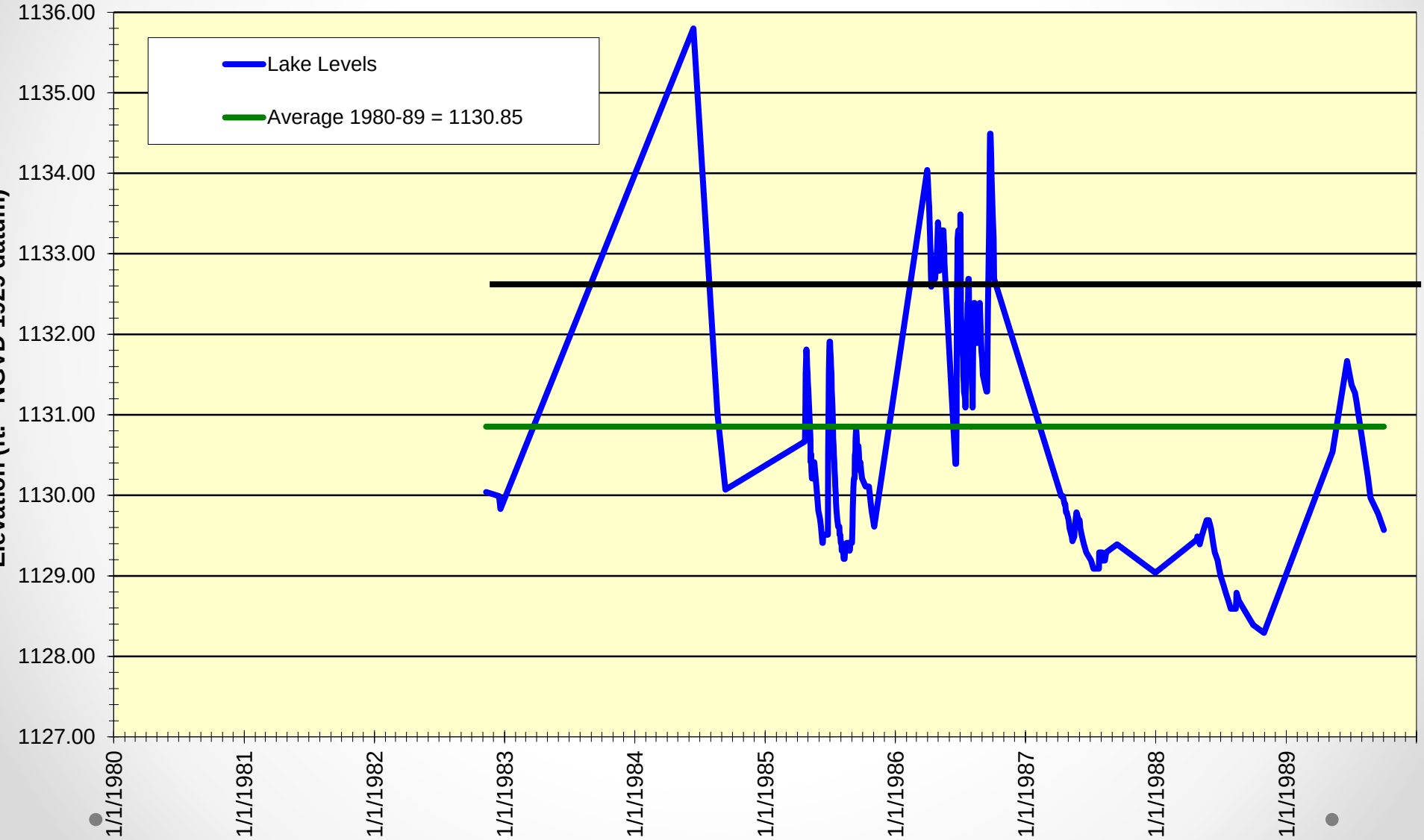
Pink Flag = OHWL (picture taken 10/3/13 after 2" rainfall event) Water level: 1130.31 NAVD 88

Pink Flag = OHWL (different perspective)

Two Rivers Lake (73-0138), StearnsCounty

305 Reported Lake Levels 1980 to 1989

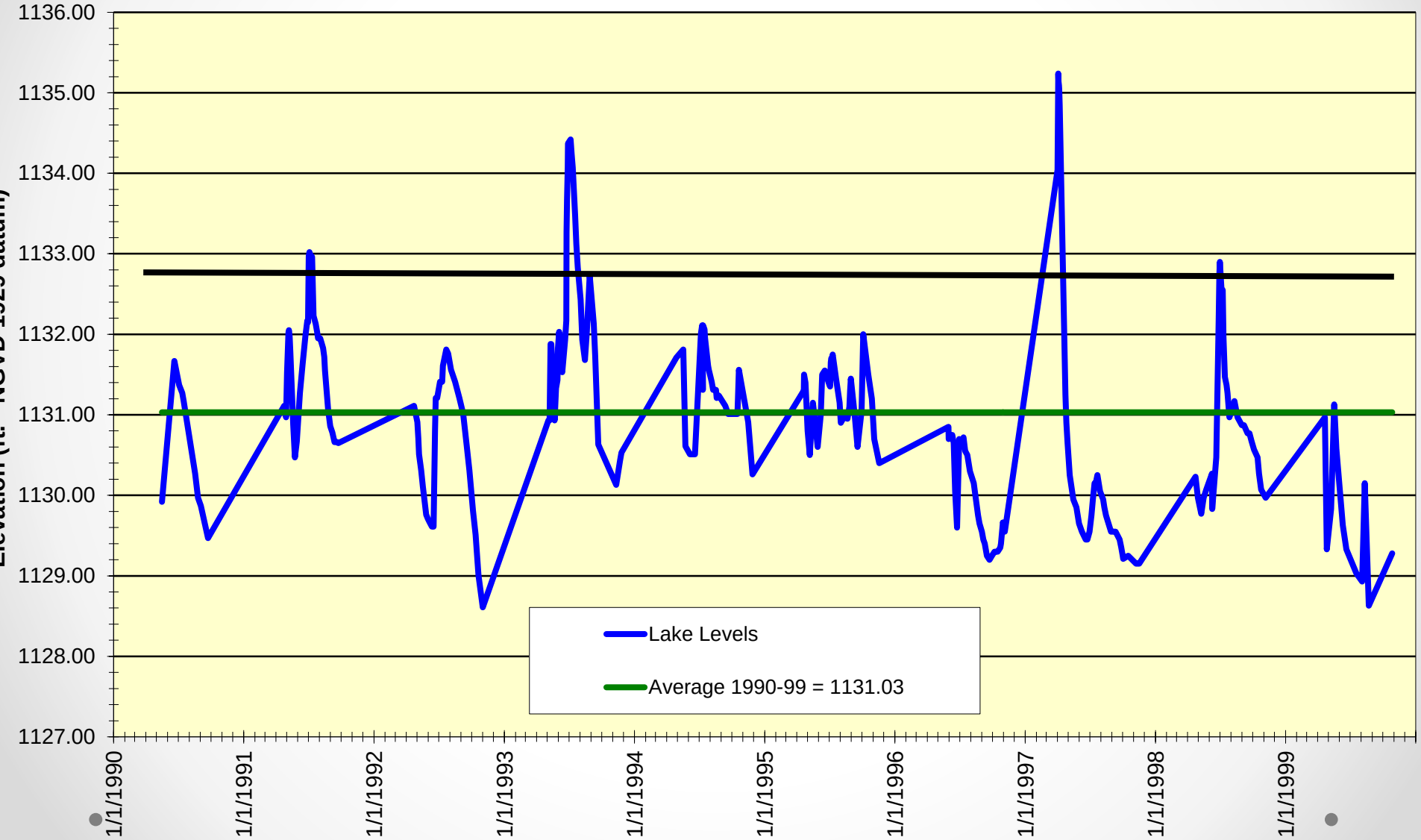
DNR Lake Level Monitoring Program



Two Rivers Lake (73-0138), StearnsCounty

282 Reported Lake Levels 1990 to 1999

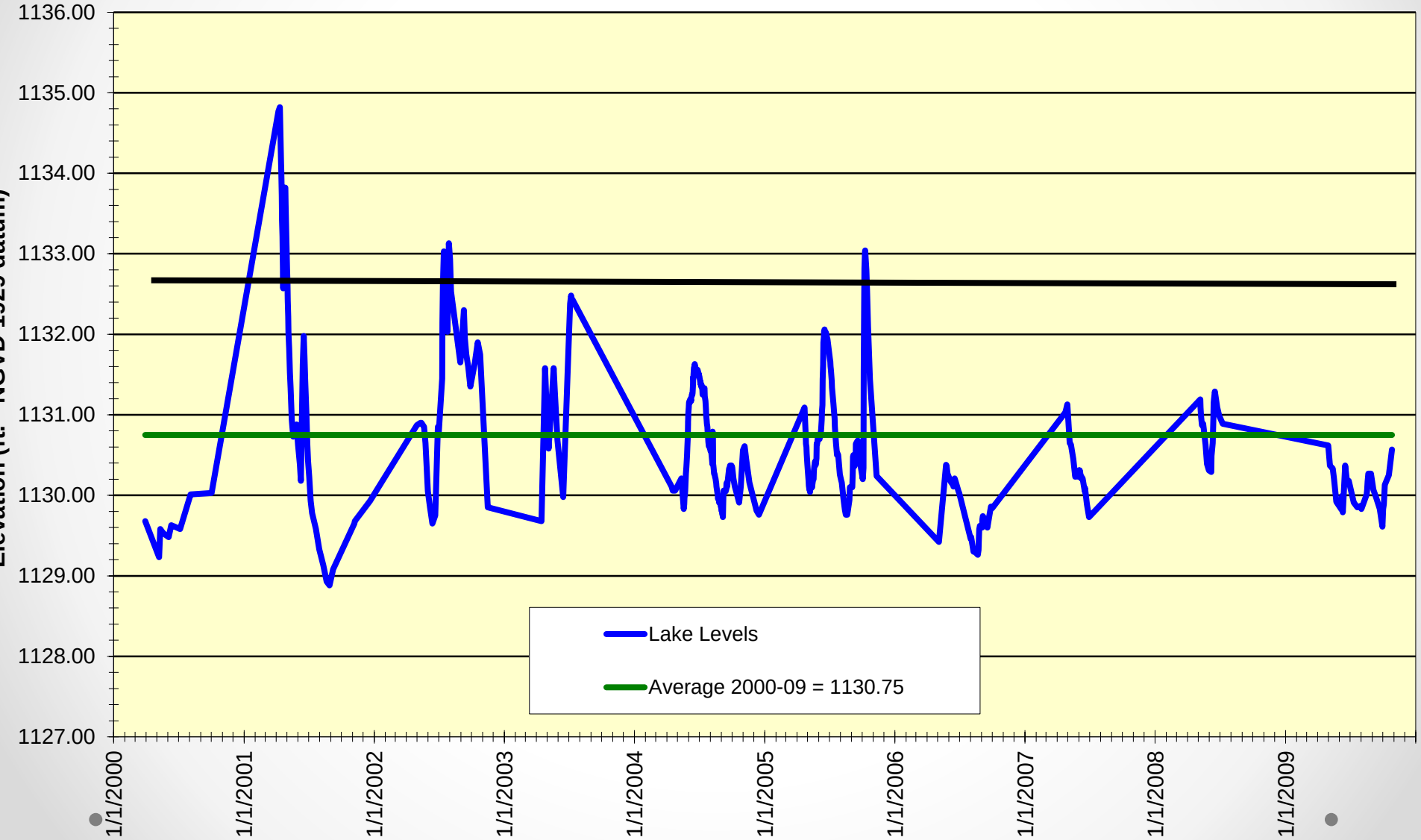
DNR Lake Level Monitoring Program

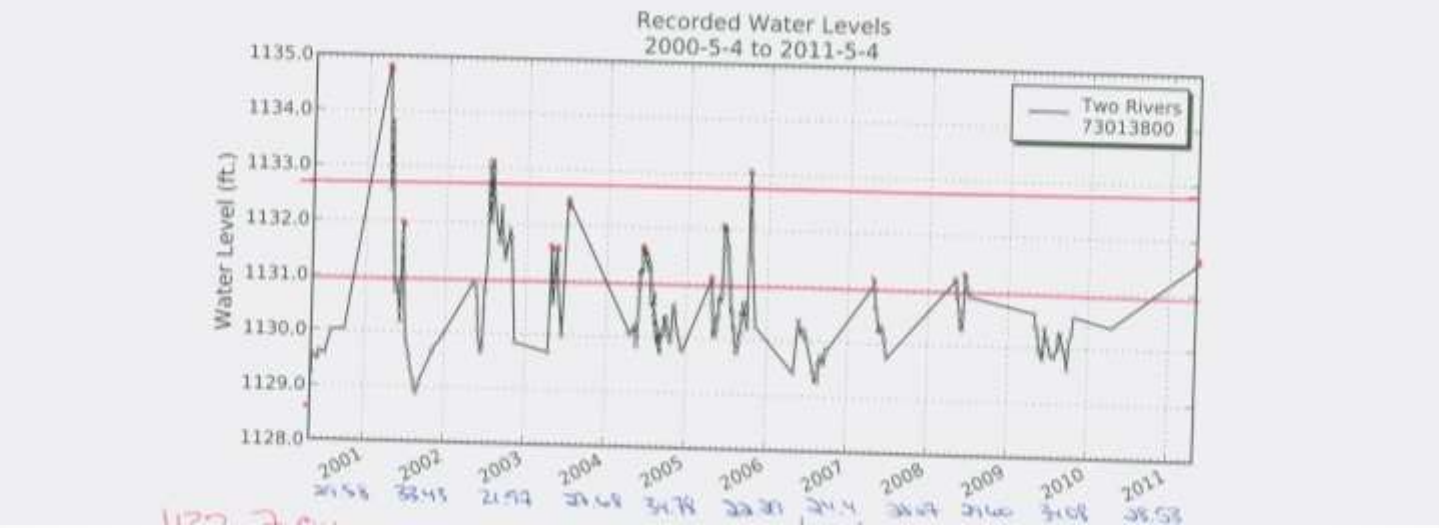


Two Rivers Lake (73-0138), StearnsCounty

486 Reported Lake Levels 2000 to 2009

DNR Lake Level Monitoring Program



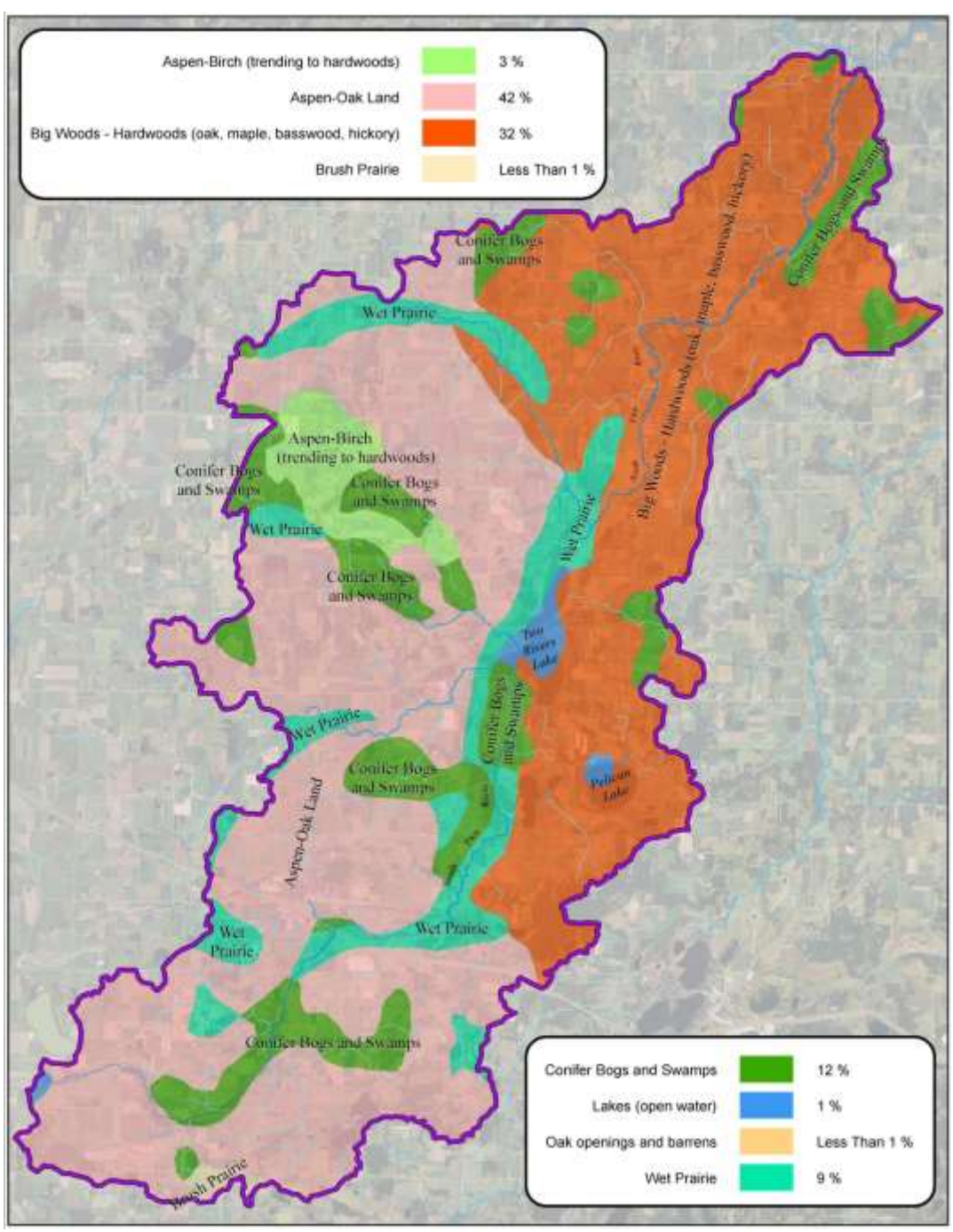


- Average water elevation: 1131.41 navd88
- Above average Water levels: peaked **39 times (1080 readings)**
- Above OHWL (1133.25): **10 times (6 of 10 above 1134.5)**
- **Base Flood Elevation: 1136.7 navd88 (3.5 ft above OHWL)**

Watershed System Changes

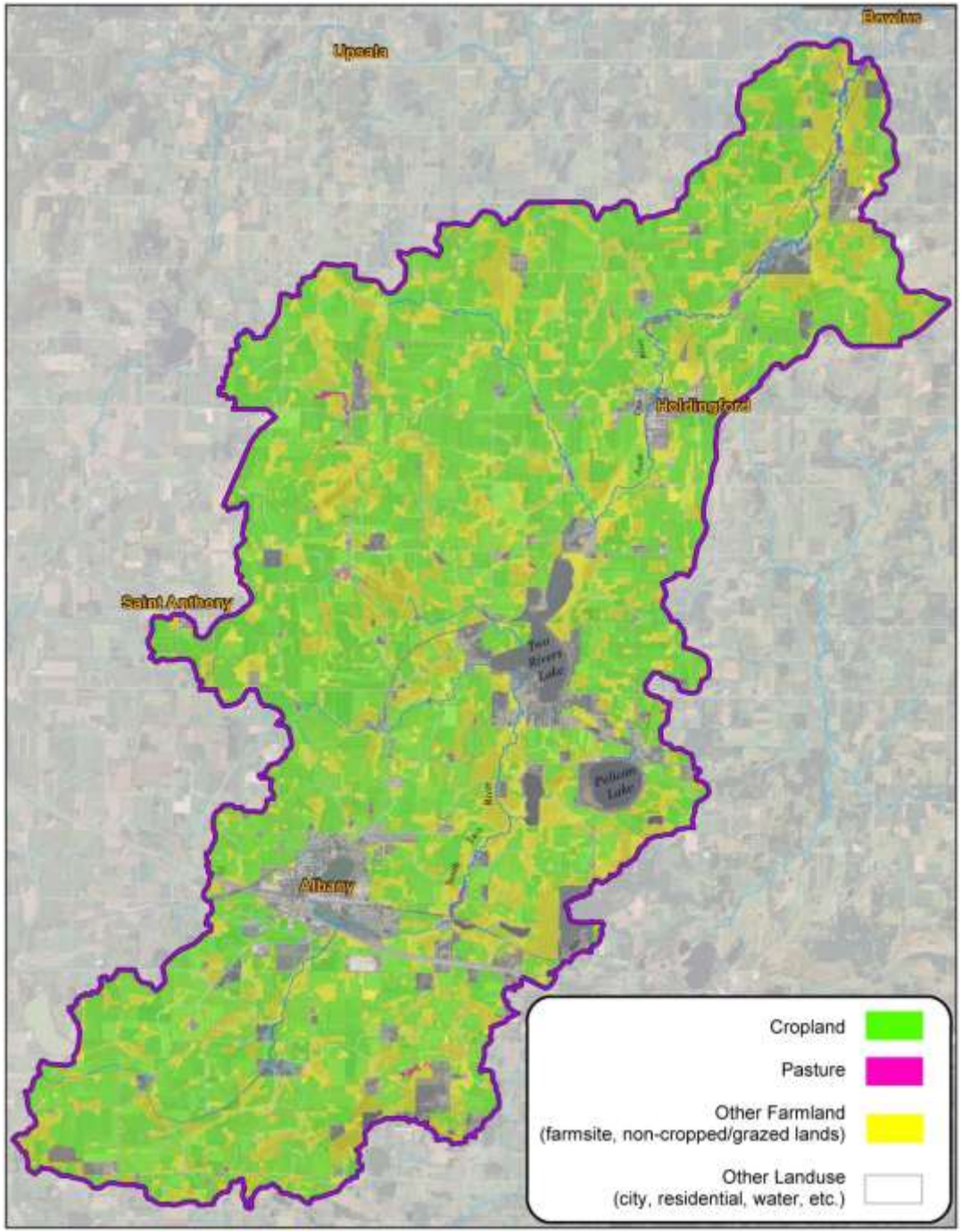
- Issues due to landscape/hydrology changes occurring over the last 100+ years.
  - Agriculture Changes
  - Lakeshore Development
  - Residential Development
  - Urban Development
- Water running off landscape more quickly into streams/ditches and the lake (altered hydrology)
- Faster moving water has greater potential to carry sediment and nutrients

Changes over time: more intensive agricultural practices, lakeshore residential development



Pre-Settlement Vegetation

- Approx. 1895
- 77% Hardwoods, Aspen-Birch
- 21% Wet Prairies/Bogs/Swamp
- 2% Lakes, Barren, Prairie



Existing Landuse

- Over 85% of watershed tied to Agriculture…
- …54.8 % of this being cropland
- Intensive Shoreland Development on Two Rivers Lake
- Growing Cities of Albany and Holdingford

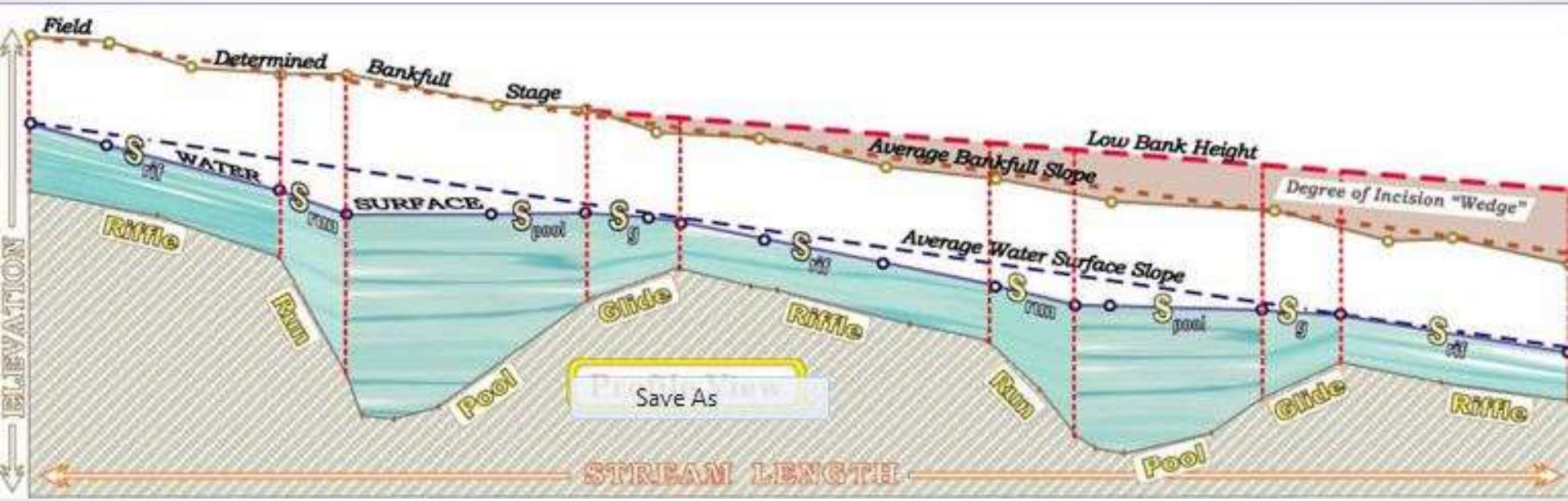
Field Work and Survey Data

Covered Bridge

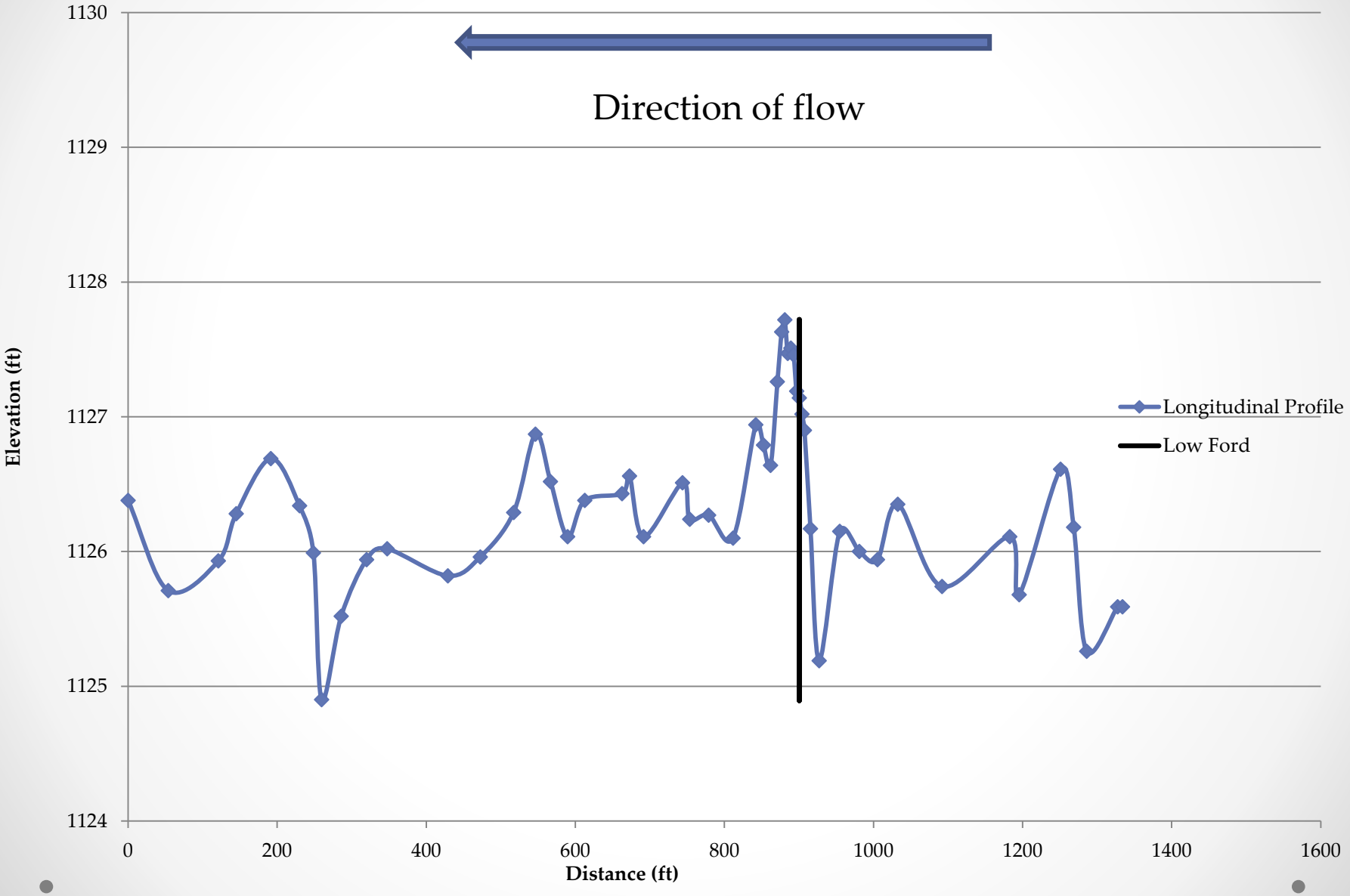
Low-Water Ford Crossing

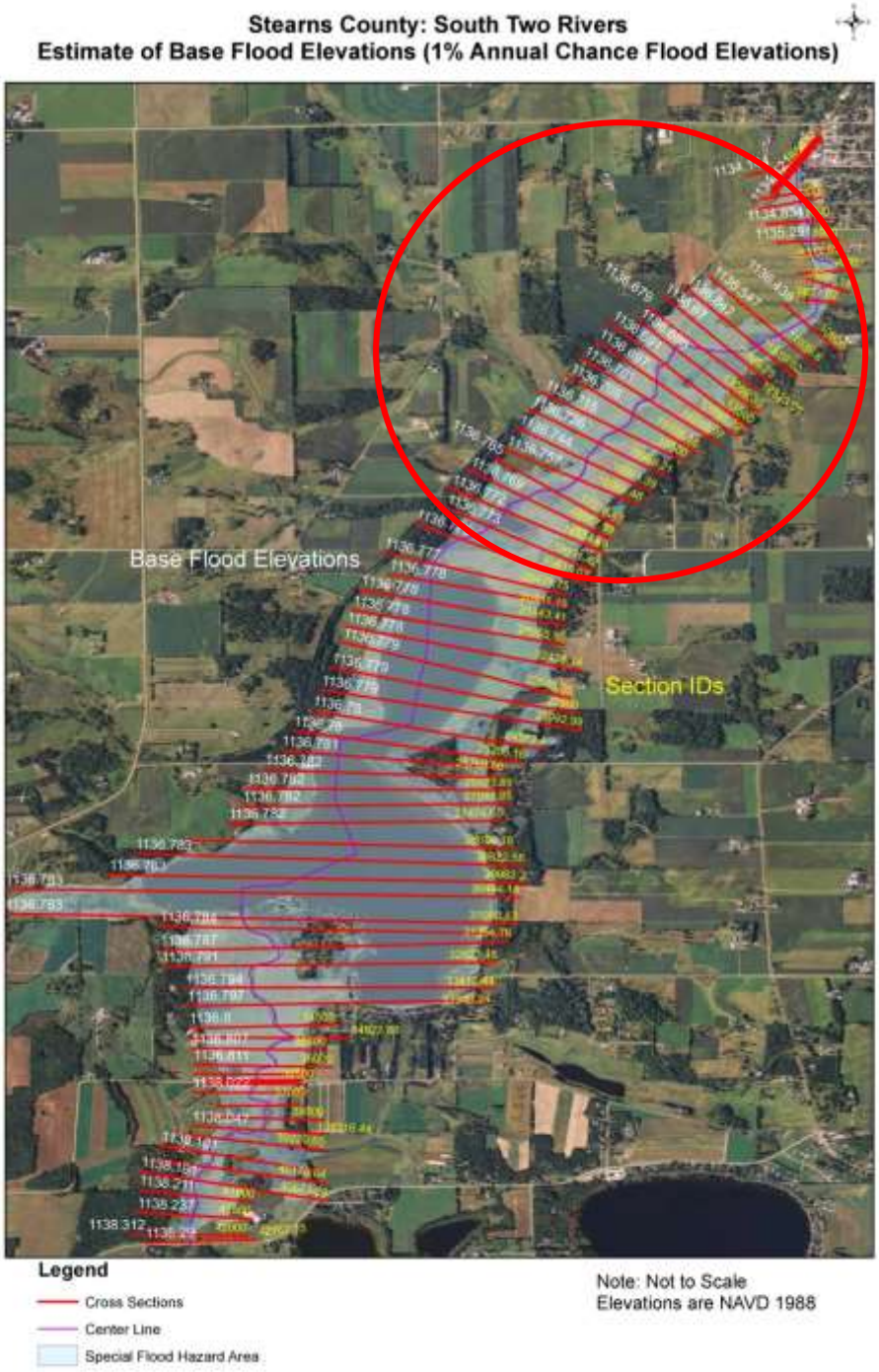
Krain's Creek

Sample Stream Profile



County Ditch 28 - Field Surveyed Longitudinal Profile Sample

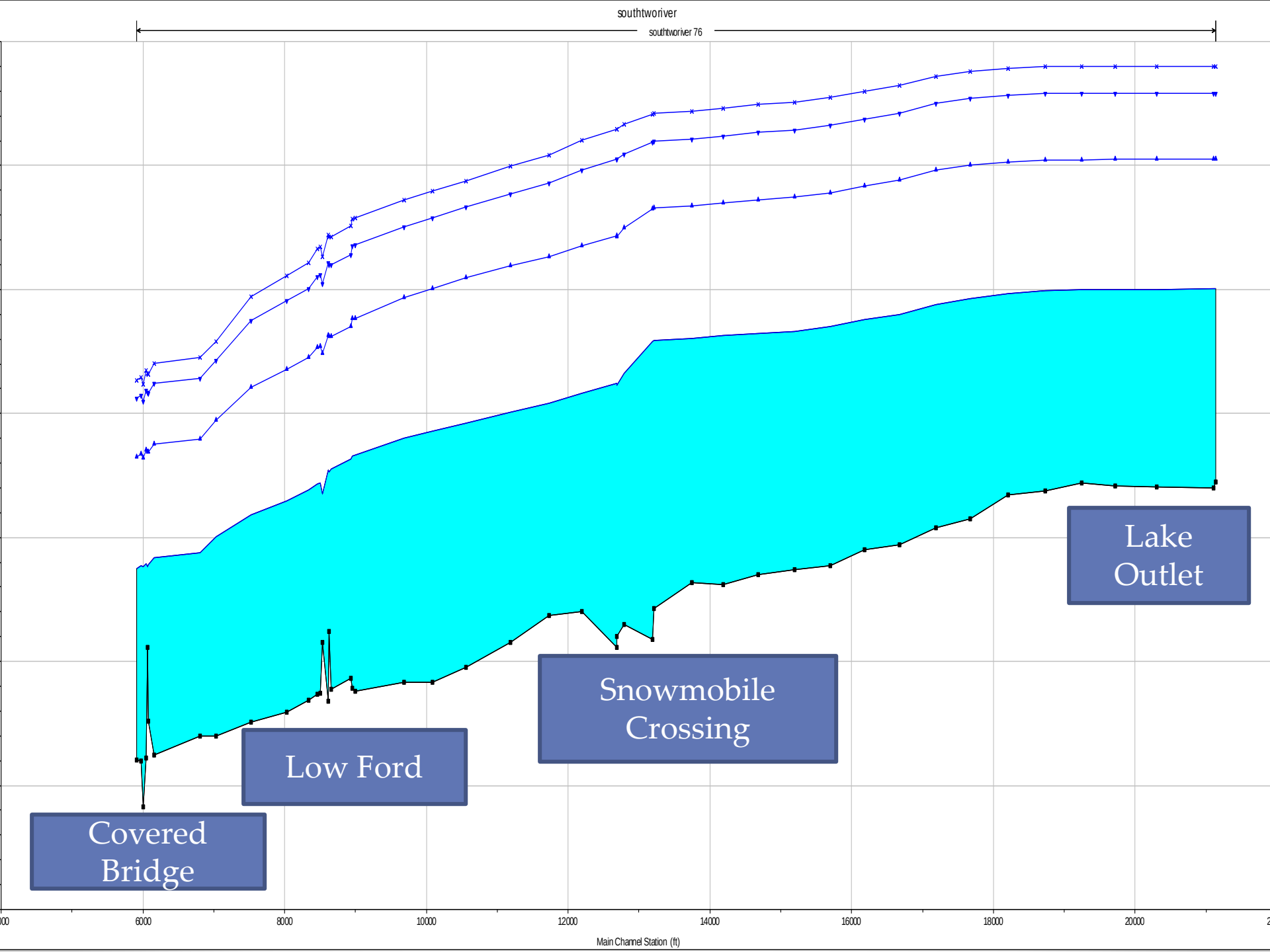


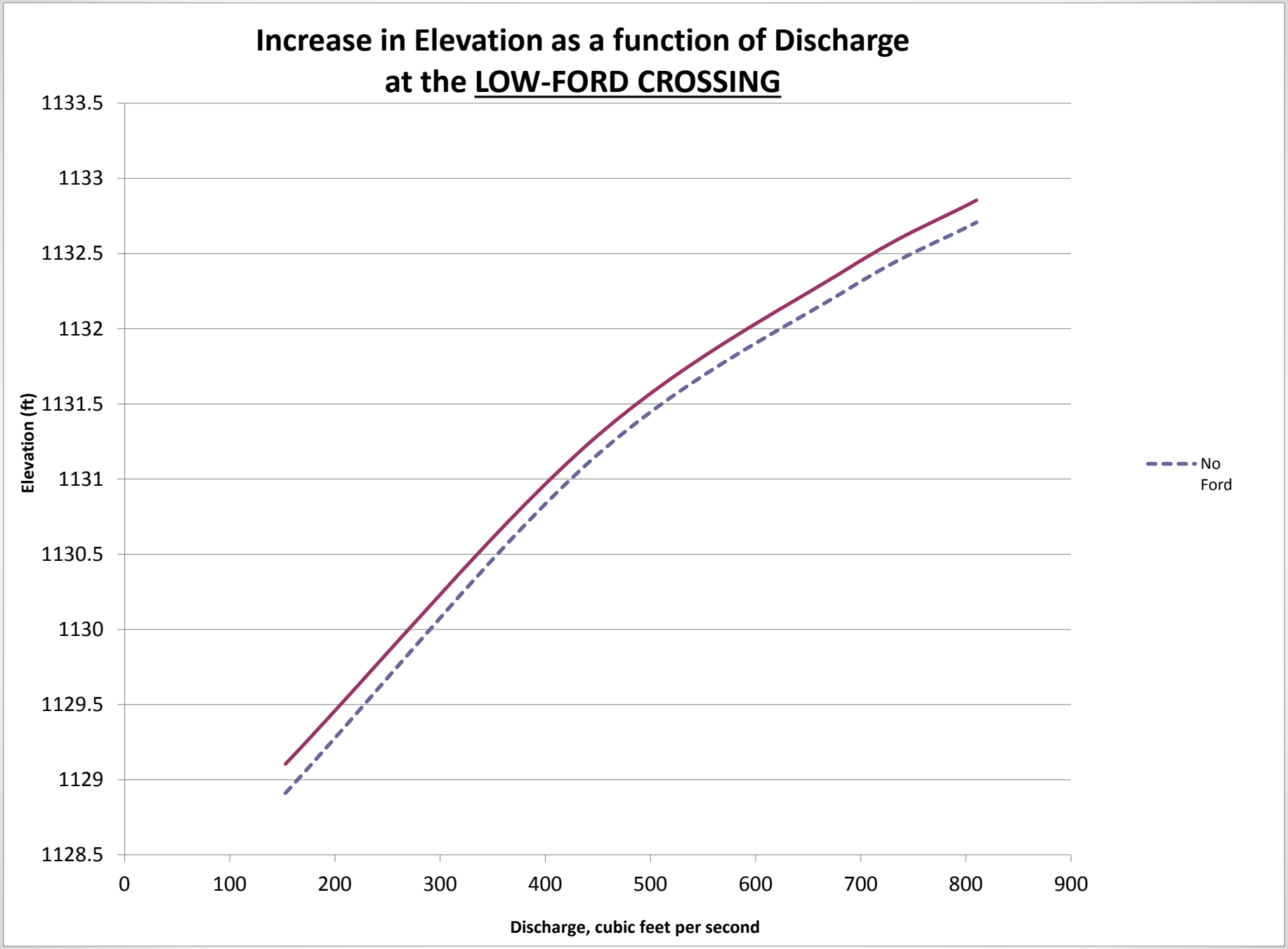


HEC-RAS Model Results

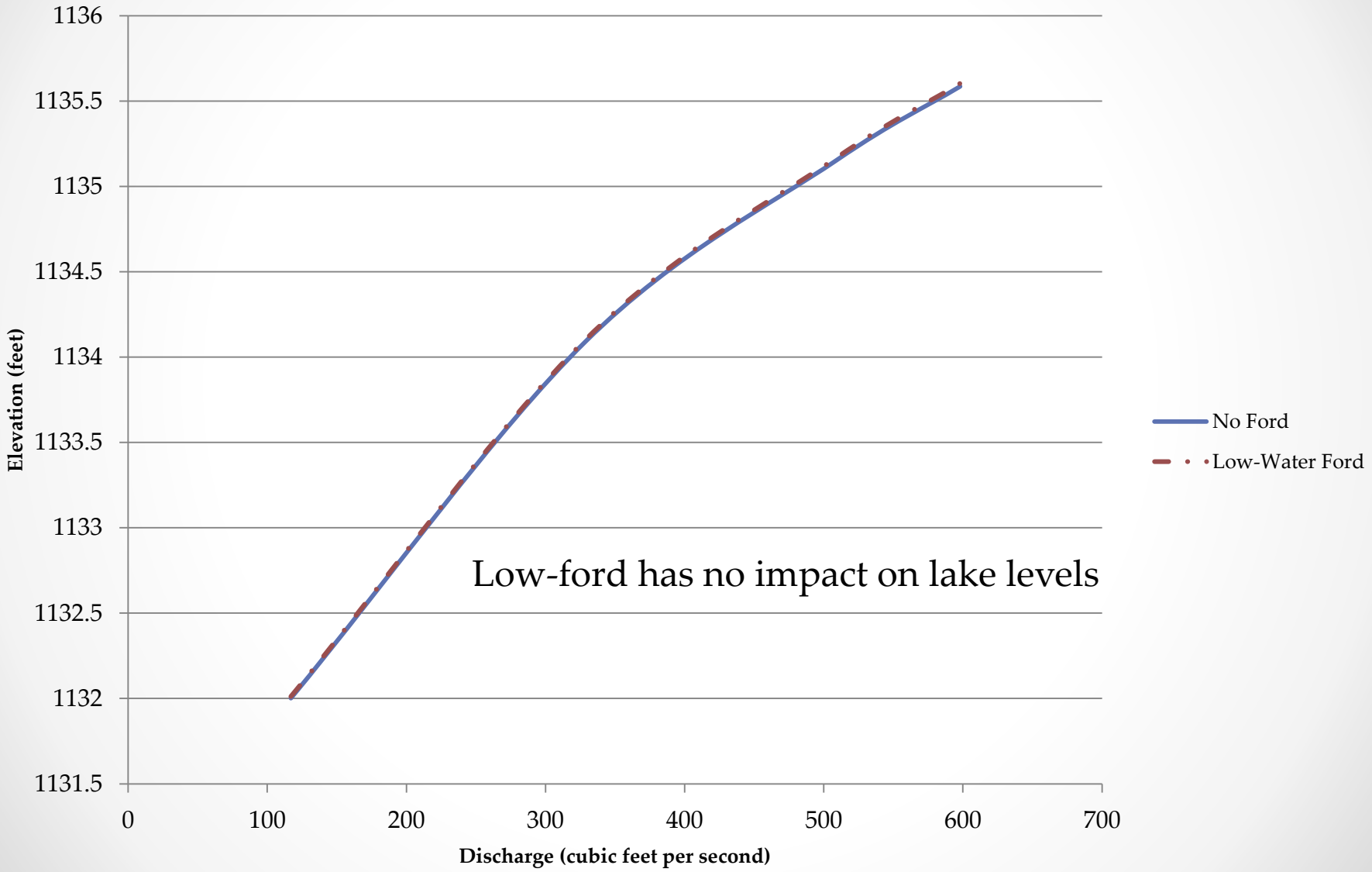
Modeling CD 28

- Built upon FEMA flood study
- Use combination of LIDAR data and field-surveyed data
- Modeled with existing conditions, and without low-water ford;
- 1.5-yr; 10-yr; 50-yr; and 100-yr events

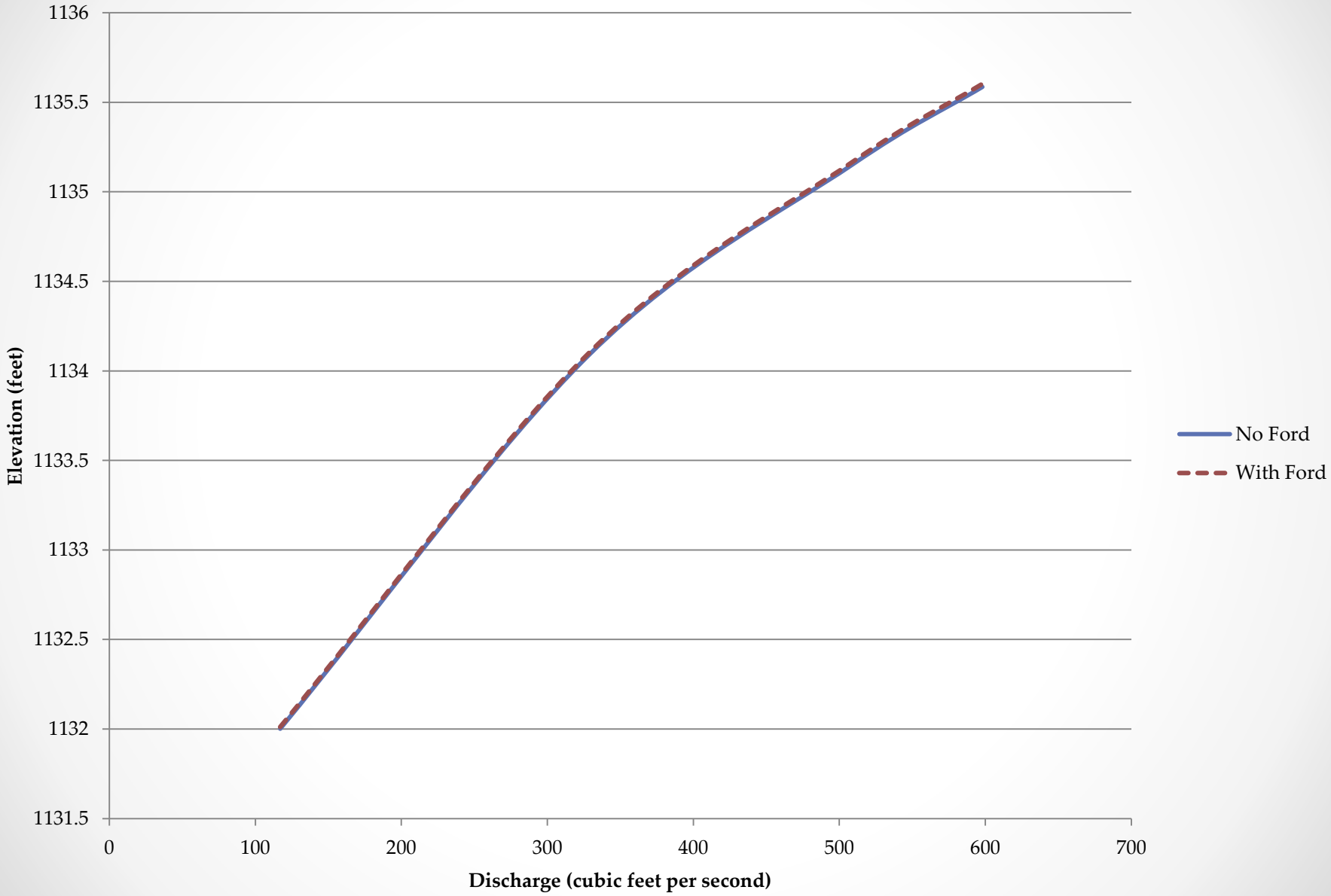

southtworiver
southtworiver 76
Lake Outlet
Snowmobile Crossing
Low Ford
Covered Bridge
6000
8000
10000
12000
14000
16000
18000
20000
Main Channel Station (ft)

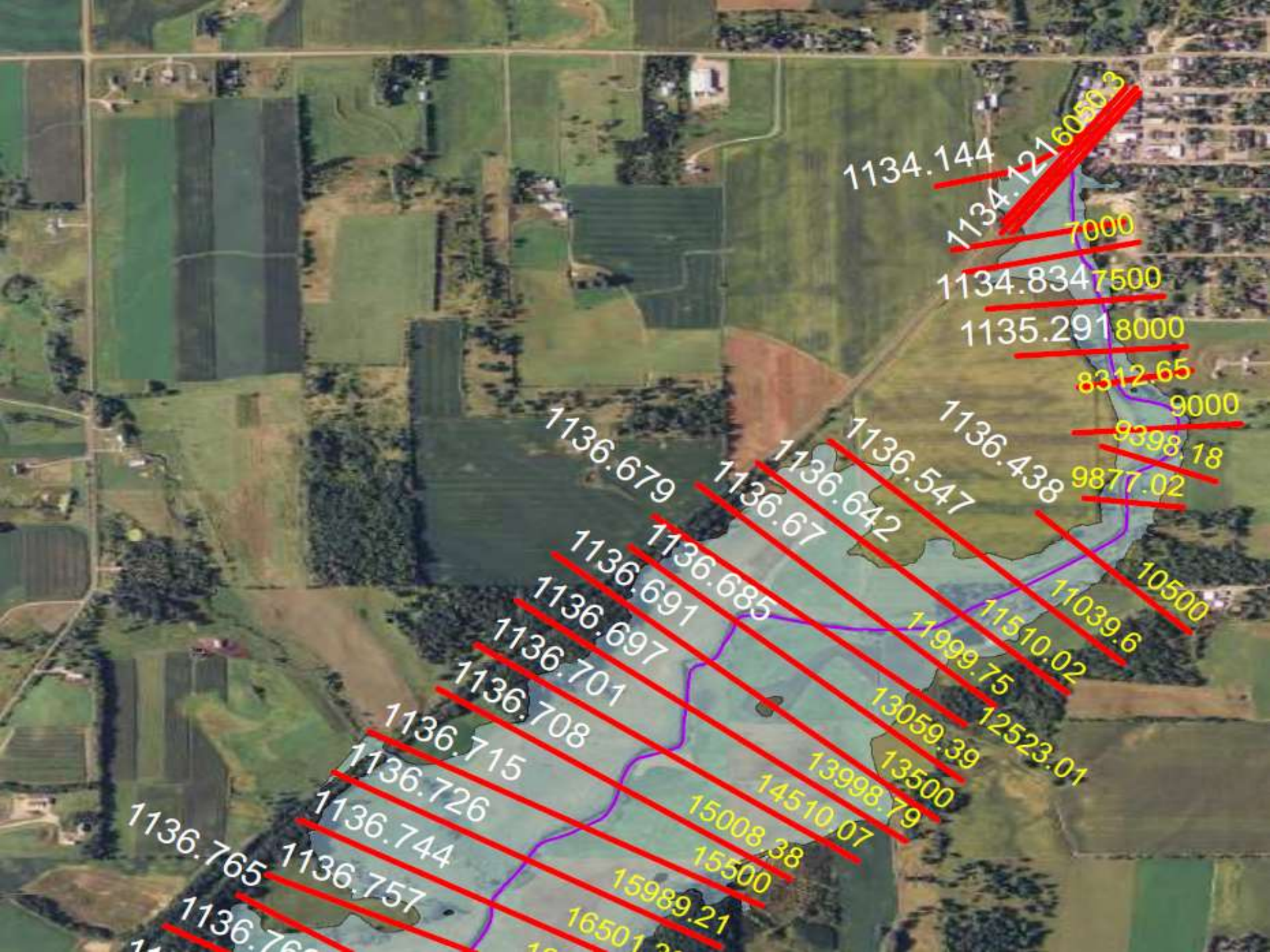

Increase in Elevation as a function of Discharge
at the LOW-FORD CROSSING
1133.5
1133
1132.5
1132
1131.5
1131
1130.5
1130
1129.5
1129
1128.5
Elevation (ft)
0
100
200
300
400
500
600
700
800
900
Discharge, cubic feet per second
No
Ford

Elevation increase as a function of discharge at the LAKE OUTLET



Elevation increase as a function of discharge at Station 12500




1134.144
1134.121
6000
7000
1134.834
7500
1135.291
8000
8312.65
9000
9398.18
9877.02
10500
11039.6
11510.02
12523.01
13500
13998.79
14510.07
15008.38
15500
15989.21
16501.2
1136.679
1136.67
1136.685
1136.691
1136.697
1136.701
1136.708
1136.715
1136.726
1136.744
1136.757
1136.765
1136.642
1136.547
1136.438
11999.75
13059.39

Corps of Engineers – Clean Water Act

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US Army Corps of Engineers
BUILDING STRONG®

Kurt Deter

Ditch Attorney for Stearns County

- Kurt Deter is a shareholder at Rinke Noonan. He concentrates his practice in:
    - Water and Drainage Law
    - Environmental Law
    - Representation of Counties, Watershed Districts, Land Owners and Other Local Governmental Units
    - Regulatory Compliance on State and
    - Federal Wetland Issues

TYPES OF PROJECTS

- **New System**
- **Improvements**
- **Lateral**
- **Impounding and Diversion of Drainage System Waters**
- **Repairs**

GENERAL PROCESS FOR NEW SYSTEMS, IMPROVEMENTS AND LATERALS

- **Informational Meeting**
  - **Engineer**
  - **Attorney**
- **Petition and Bond**
  - **New Systems – Majority of landowners or 60% of the area accounted by 40 acre tracts or government lots**
  - **Improvements and Laterals – 26% of landowners or 26% of property area that the improvement passes over.**
- **Sufficiency of Petition and appointment of engineer**
- **Preliminary Engineer's Report**
- **Preliminary DNR Advisory Report**
- **Preliminary Hearing**
- **Appointment of viewers and order to complete Final Engineer's Report**
- **Final Engineer's Report and Final DNR Advisory Report**
- **Final Hearing**
- **Establishment of project and adoption of Viewers' Report**
- **Appeals Under 103E.091 and 103E.095**
- **Awarding of Construction Contract**
- **Construction**
- **Acceptance of Contract**

Stearns County Environmental Services

Chelle Benson – Environmental Services Director
Telephone: 320.656.3613
Toll free: 800.450.0852


PERMITS
OHWL Contour
Flood Zone
A


Two Rivers Lake
PERMITS
1- Shoreland Alteration
2- (CUP) Conditional Use Permit, To Add Fill
3- (CUP) Alternative Elevation Method
4- Variance, Closer To OHW
5- Variance, To Road
6- (CSP) Construction Site Permit, No Elevation
7- (CSP) With Elevation
8- (CSP) Flood Proofing
Property Damage Assessment
OHWL Contour
1133.25 elevation
Flood Zone
A
CD28 Benefited Acres Boundary
Sections

Stearns County Emergency Management

Erin Hausauer – Emergency Management Director
Contact Phone – 320-259-3940

Helpful Websites

- FEMA – Floods
  - http://www.ready.gov/floods
- MN Homeland Security and Emergency Management
  - https://dps.mn.gov/divisions/hsem/weather-awareness-preparedness/Pages/severe-weather-flooding.aspx
- Stearns County Emergency Management
  - http://www.co.stearns.mn.us/LawPublicSafety/EmergencyServices/Flooding

Watershed Restoration and Protection

WRAPs and Clean Water Accountability

Mississippi River Sartell Watershed – Two Rivers Lake

CLEAN WATER LAND & LEGACY AMENDMENT

October 23, 2013

Phil Votruba
Watershed Division

Clean Water Act & TMDLs

- Federal Clean Water Act '72
- Goal – "restore and maintain the chemical, physical and biological integrity of the Nation's waters"
- Framework to protect and restore water quality
  - Requires states to set WQ standards
  - TMDLs for impaired waters
  - Protection and Control strategies
- Point and Non-poir

Total Maximum Daily Load (TMDL)

- Not a Program – It's an Equation
- TMDL = WLA + LA + MOS + RC
  - WLA - Waste Load Allocation (point sources)
  - LA - Load Allocation (non-point sources)
  - MOS - Margin of Safety
  - RC - Reserve Capacity
- Pollution Diet
- Calculated for single parameters

The (Old) TMDL Approach

- Single parameter/single segment
- Focused on chemistry
- Small to huge
- 4-8 years
- Costly
- 100 year plan

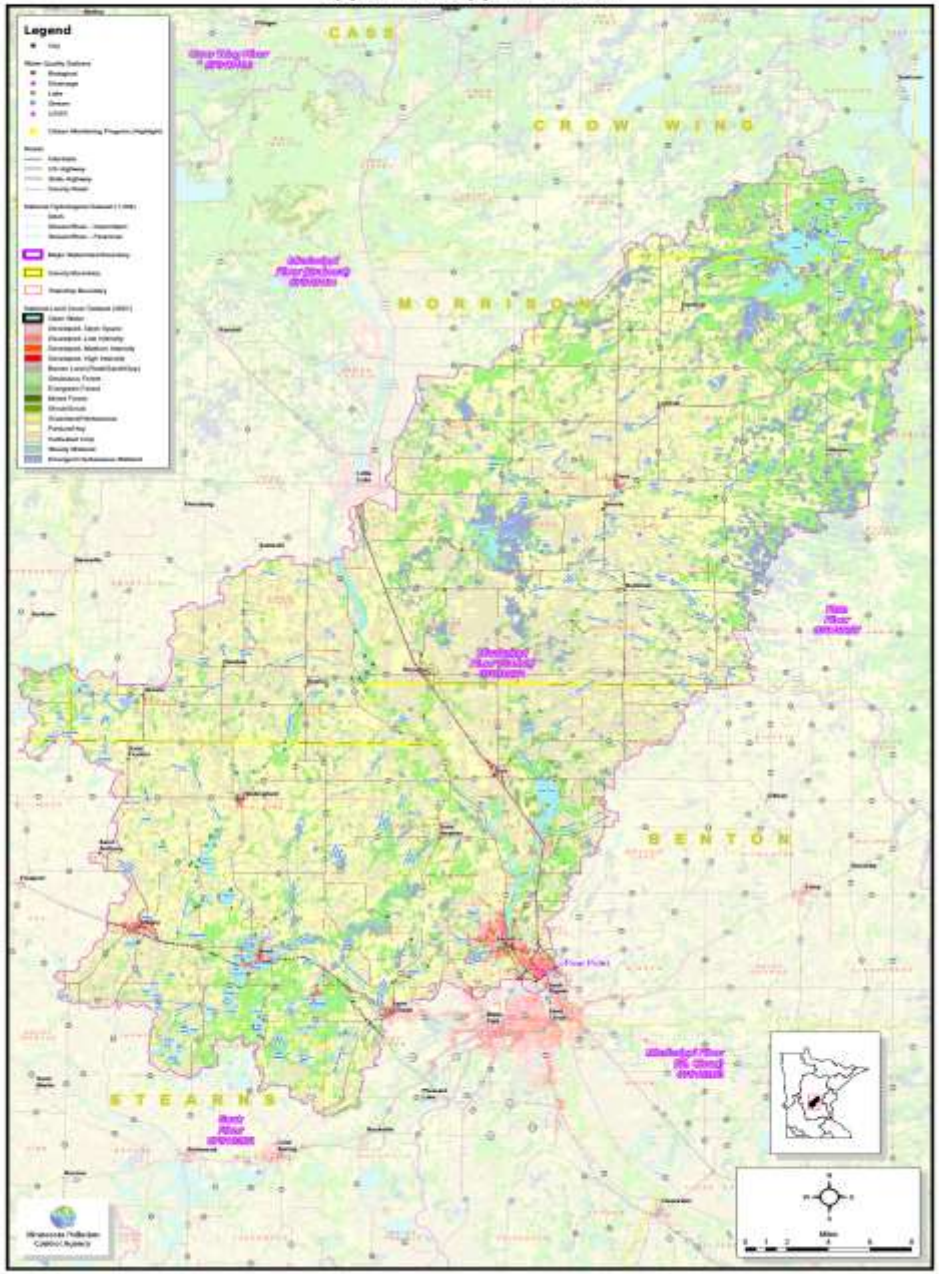
2006 Clean Water Legacy Act

- Identify impaired waters in 10 years
- Develop TMDLs (10% per year)
- Implement restoration
- Promptly delist
- Comply with CWA requirements
- Protect unimpaired waters
- Early involvement of stakeholders

CLEAN WATER LAND & LEGACY AMENDMENT

Mississippi River (Sartell) Watershed

Upper Mississippi River Basin



The 10 Year Cycle

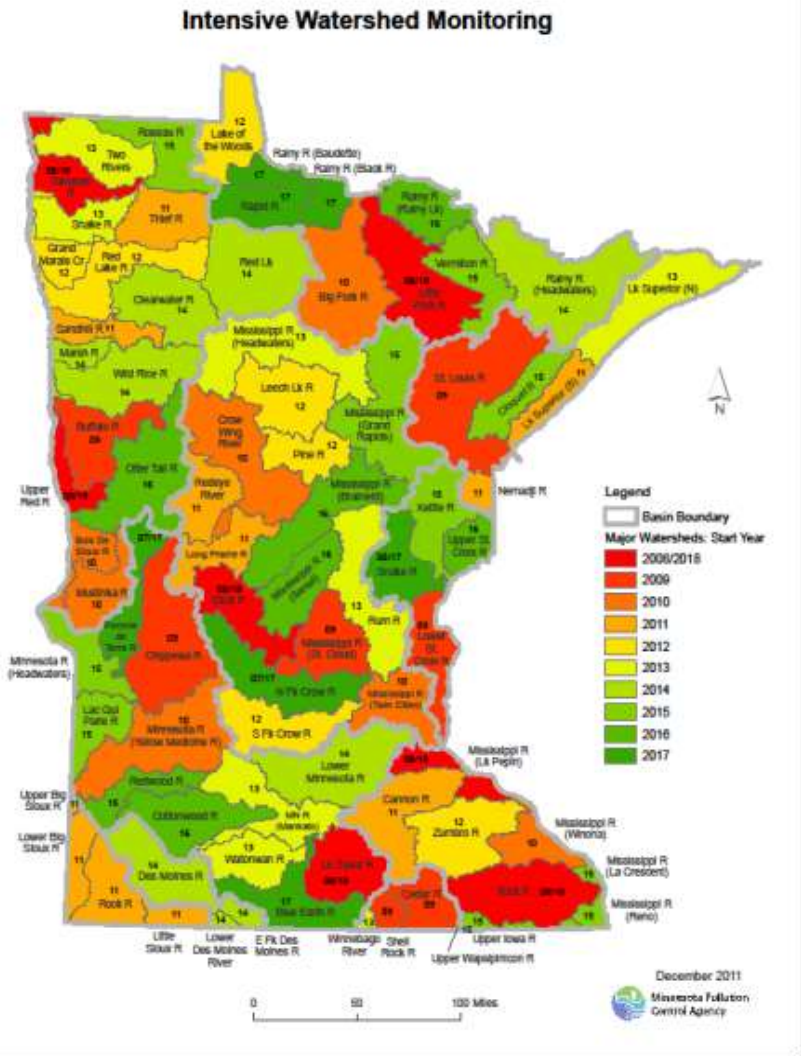
Monitoring and Assessment

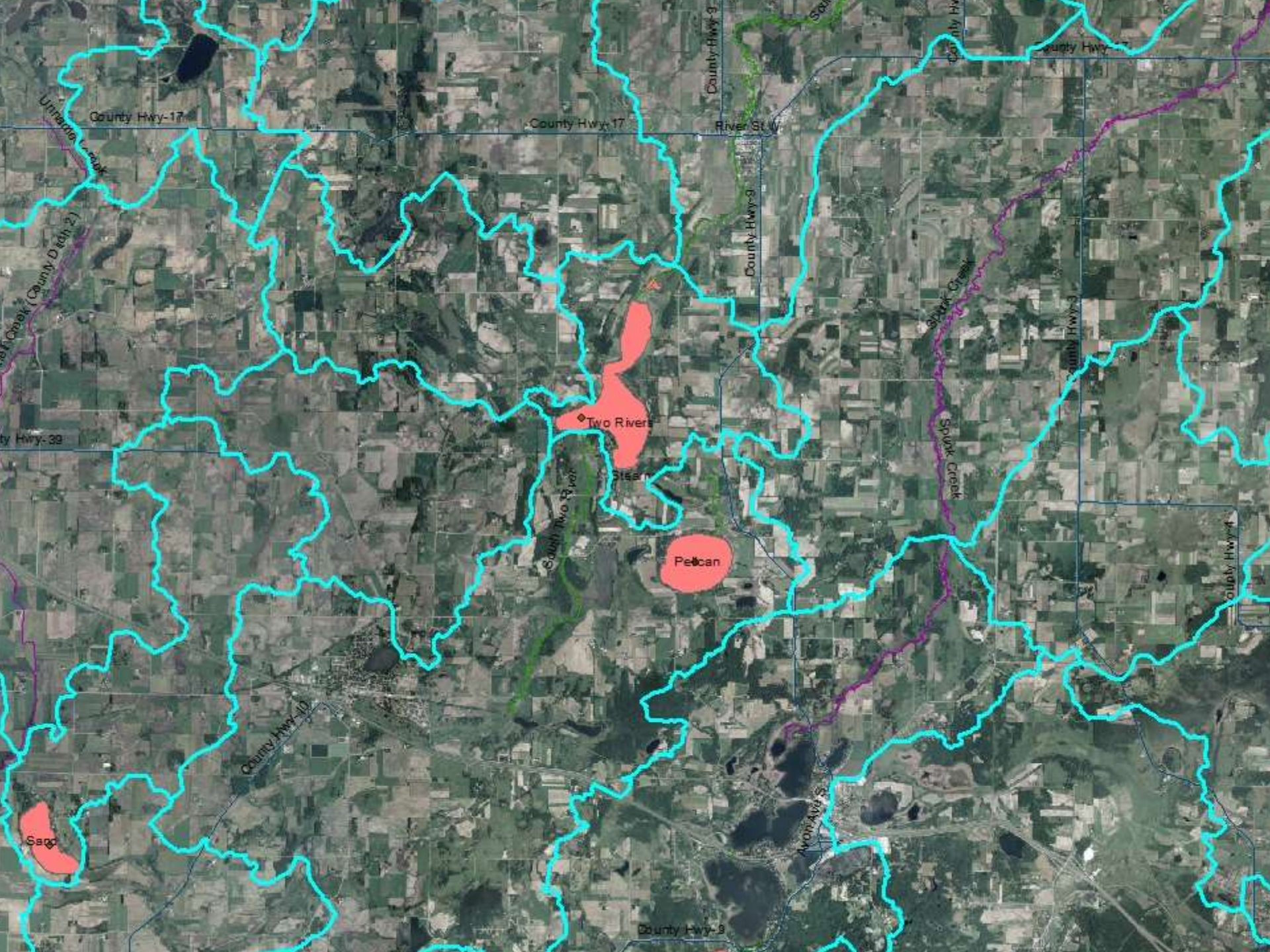
Condition monitoring

Effectiveness monitoring

Every

10 Years




County Hwy-17
County Hwy-17
River St W
County Hwy-3
Spunk Creek
Spunk Creek
Two Rivers
Stearns
Pelican
Sand
County Hwy-10
County Hwy-9

The Watershed Approach

- Watershed approach => managing the system
- Physical /Chemical/ Biological => comprehensive
- Restoration and Protection
- Tools and Procedures => to define problems and solutions
  - Water quality assessments for lakes and streams
  - Process to identify biological impairment stressors
  - Pollutant load and wastewater discharge limit modeling
  - Develop impaired water TMDL studies for EPA approval
  - Develop focused and targeted implementation strategies
  - Adaptive Management
- Data and information to tell the story
- Accountability =>Data and measures to track

Then and Now

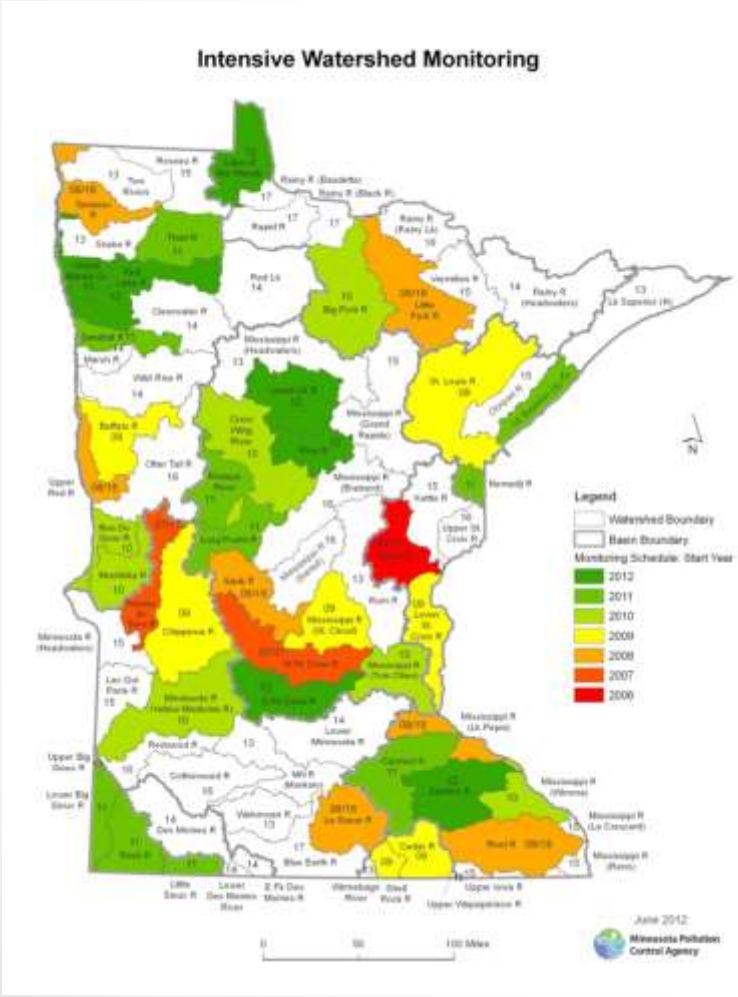
	Pre 2008	Now
Focus	Federal TMDL requirements	Clean Water for MN
Scope	Single parameter impairments	Impairments and Protection for Watershed
Scale	Variable: tiny to huge	8 digit HUC ~(81)
Data	Chemistry	Chemistry + Biology + Physical
Time	More than 4 years	4 years
Use	Permit Decisions	Permit + Local Plans + Action Decisions
Products	TMDL = WLA + LA + MOS + RA	Condition assessment + Stressor Id. + HSPF Modeling and Spatial analysis +TMDL + Locally adopted and State Approved local water/shed plan
Costs	High - $100k – $1m / TMDL	Coming down ~ $400-500k / Watershed

What will a WRAP look like?

Pomme de Terre River Watershed Report

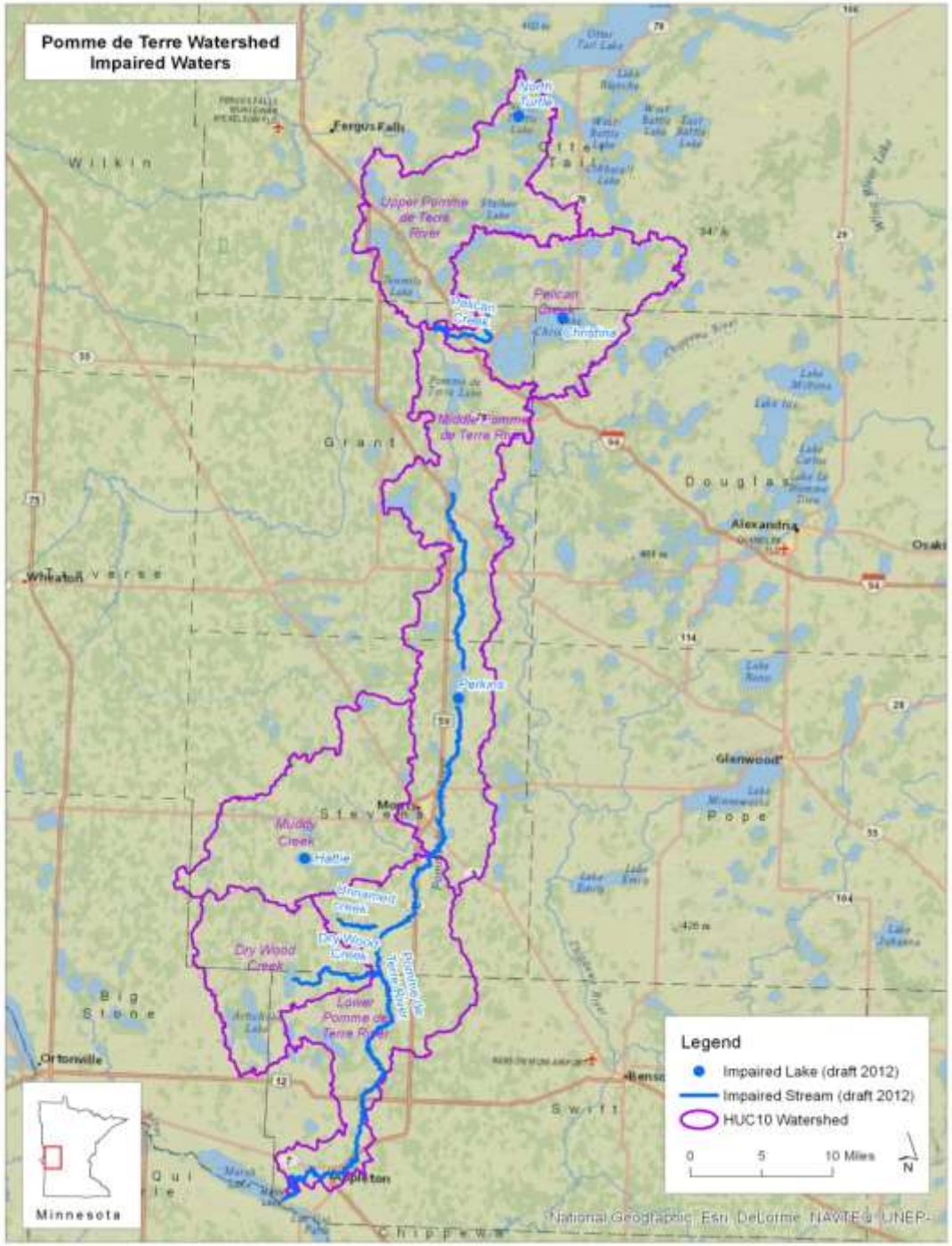
- Summary document for local planners
- Feedback from stakeholders
- 2013 Legislation
- Template finalized

Watershed Monitoring



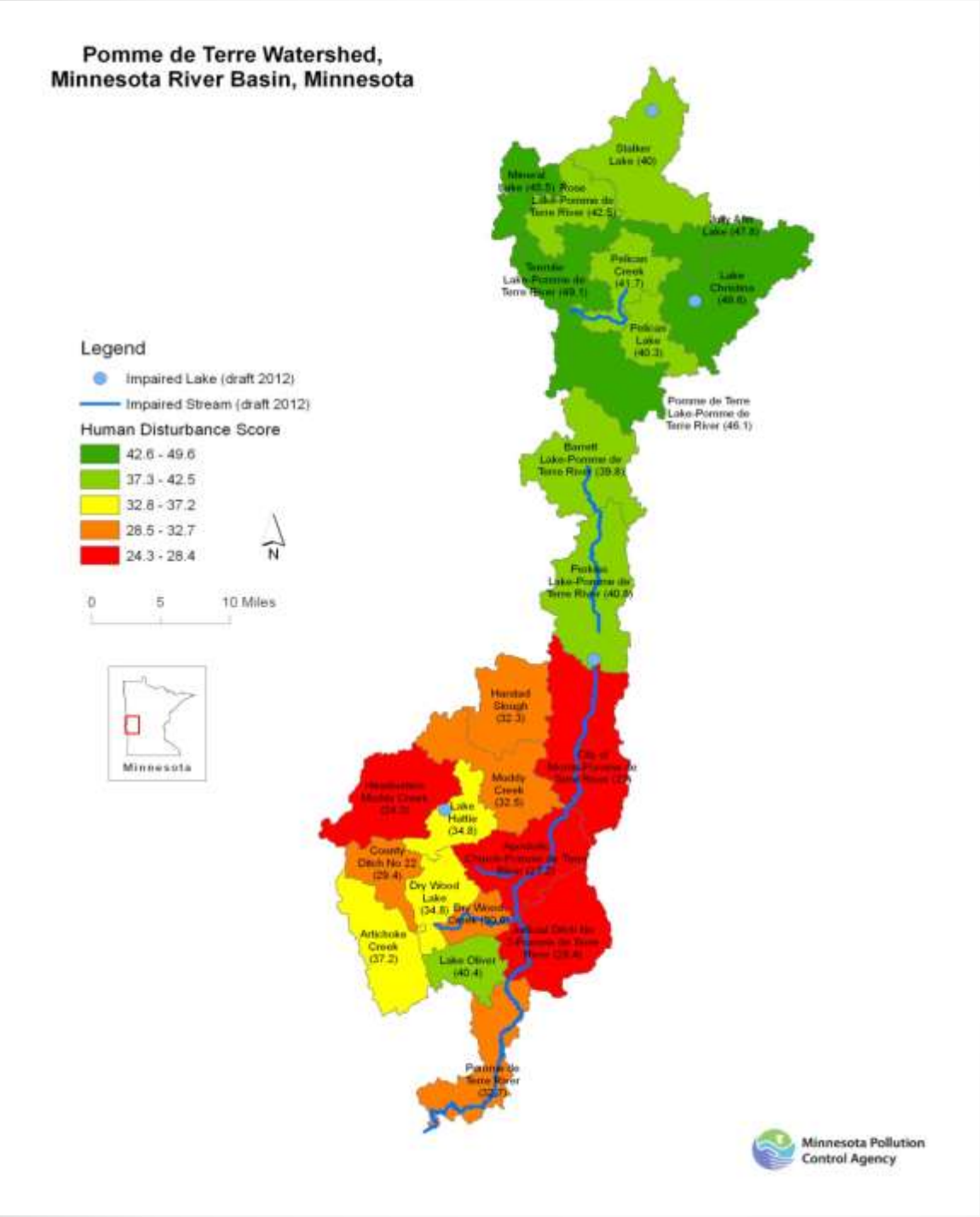
- Intensive Watershed Monitoring
  - Biological/Physical monitoring
  - Lake monitoring
  - Flow/chemical/load monitoring – ongoing
- On track to complete state in 10 years

WRAP



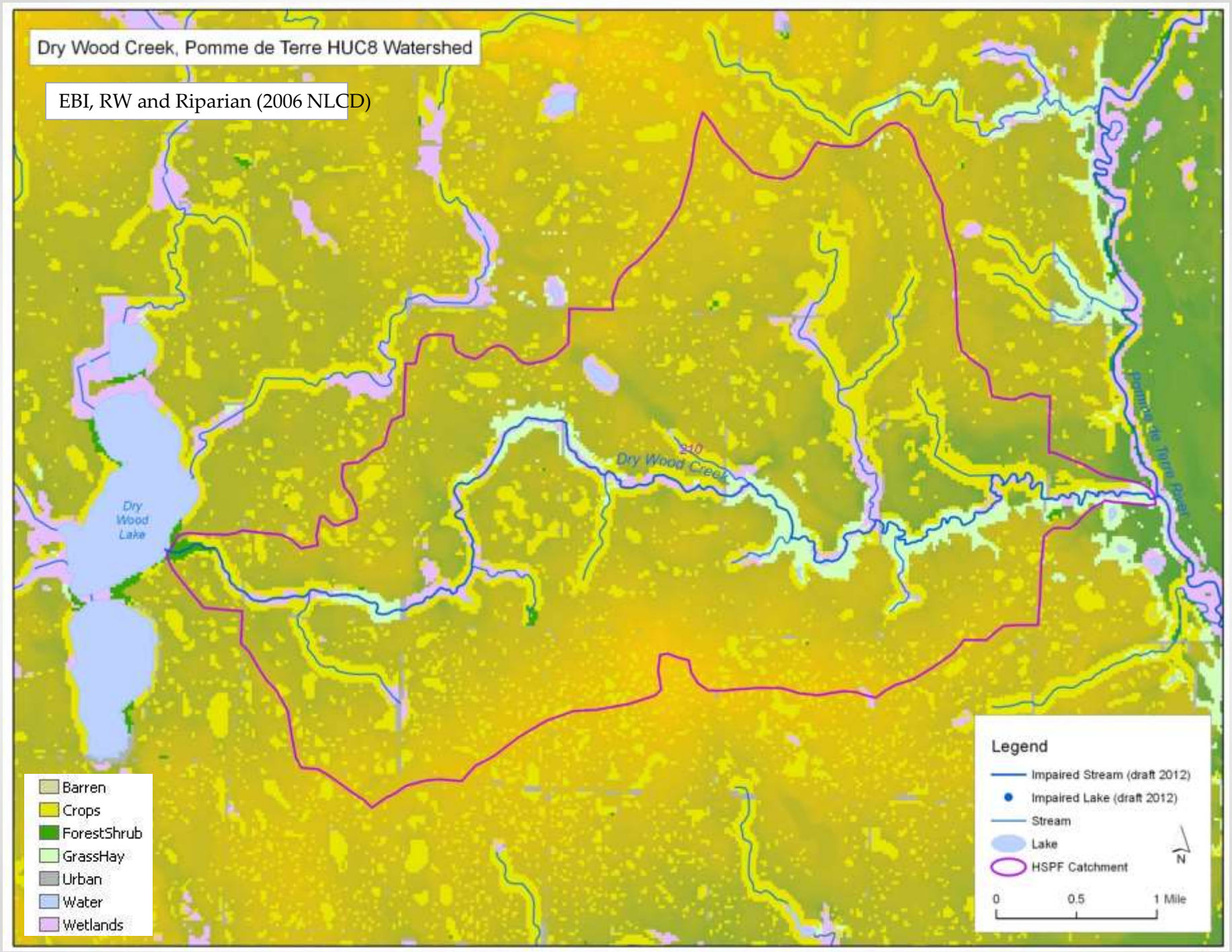
8-Digit Watershed

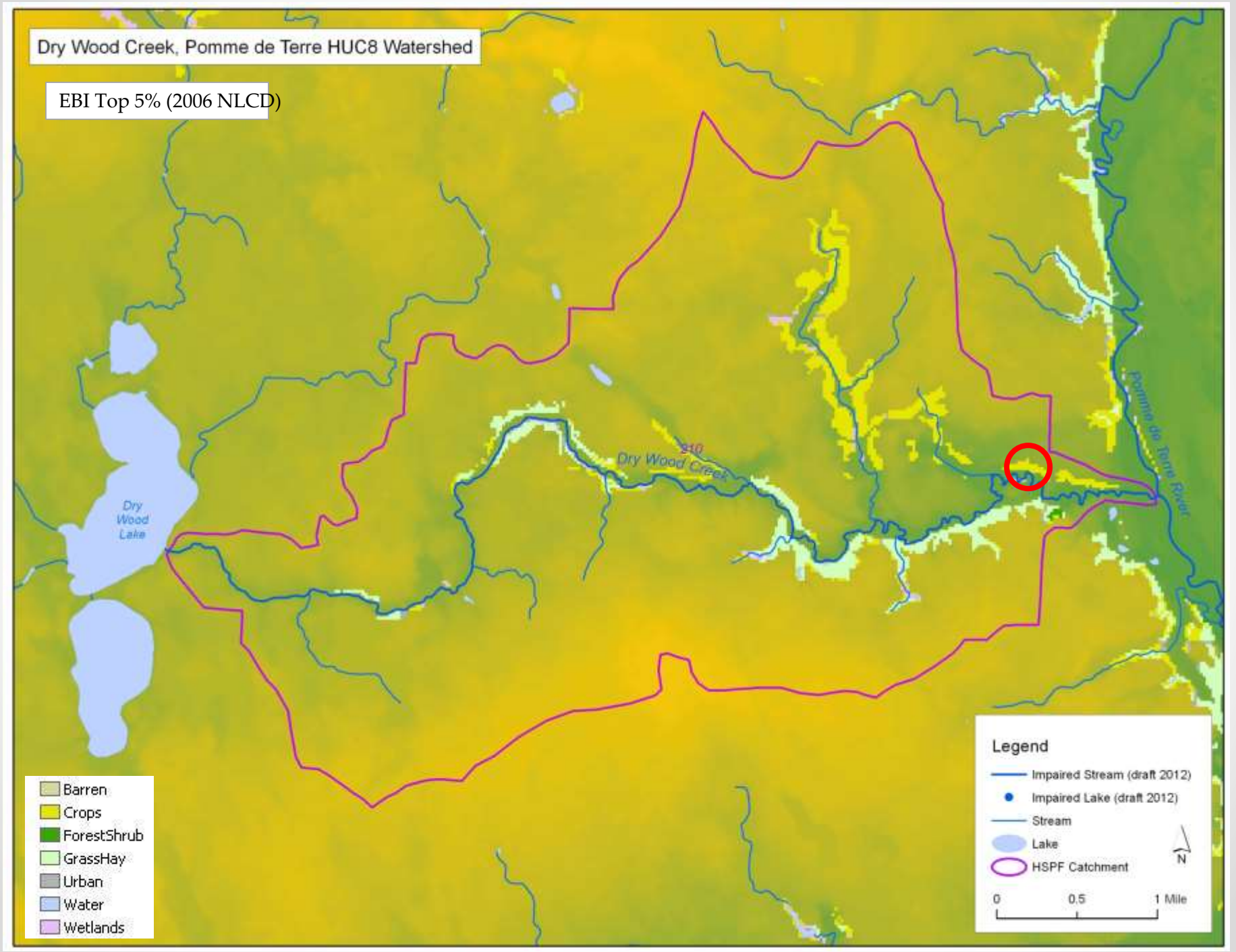
Pomme de Terre



Human Disturbance Score

- **Watershed Land Cover**
- **Riparian land cover**
- **Point sources**
- **Feedlots**
- **Stream channelization**


Dry Wood Creek, Pomme de Terre HUC8 Watershed
EBI, RW and Riparian (2006 NLCD)
Dry Wood Lake
Dry Wood Creek
Pomme de Terre River
Barren
Crops
ForestShrub
GrassHay
Urban
Water
Wetlands
Legend
Impaired Stream (draft 2012)
Impaired Lake (draft 2012)
Stream
Lake
HSPF Catchment
N
0
0.5
1 Mile


Dry Wood Creek, Pomme de Terre HUC8 Watershed
EBI Top 5% (2006 NLCD)
Dry Wood Lake
Dry Wood Creek
Pomme de Terre River
Barren
Crops
ForestShrub
GrassHay
Urban
Water
Wetlands
Legend
Impaired Stream (draft 2012)
Impaired Lake (draft 2012)
Stream
Lake
HSPF Catchment
N
0
0.5
1 Mile

Clean Water Accountability Act

Under the new law, WRAPs must include:

- A precise assessment of pollution sources
- Needed reductions, both point and nonpoint
- Timelines and milestones for measuring progress
- Strategies to put the money toward the best results
- A plan for effectiveness monitoring

In addition, the state must develop:

- Biennial reporting of progress in achieving reductions (MPCA)
- A nonpoint priority funding plan (BWSR)

It's a WRAP

The goal is clean water. To get there we are:

- Monitoring all 81 watersheds by 2017
- Monitoring not just chemical, physical and biological
- Protection as well as restoration of impaired waters
- Taking a comprehensive, focused and targeted approach
- Integrating point and non point
- Adapting – revisit and build off what's been done and see if it's working
- Reduced costs of doing assessments and TMDLs

South Two Rivers Watershed

History, Concerns and Plans

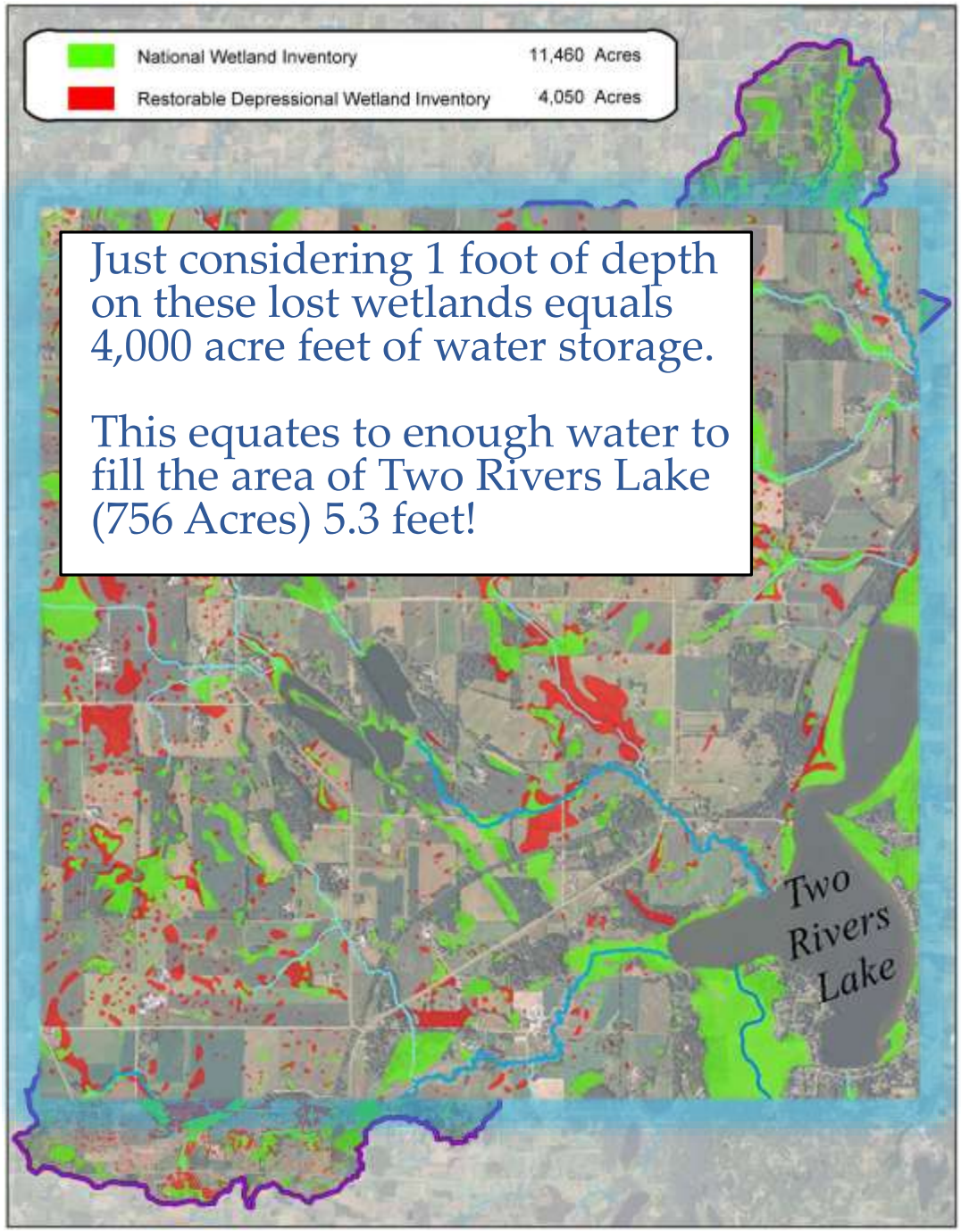
Greg Berg

Shoreland Specialist

greg.berg@mn.nacdnet.net

Stearns County Soil & Water Conservation District

(320)251-7800 www.stearnscountyswcd.net



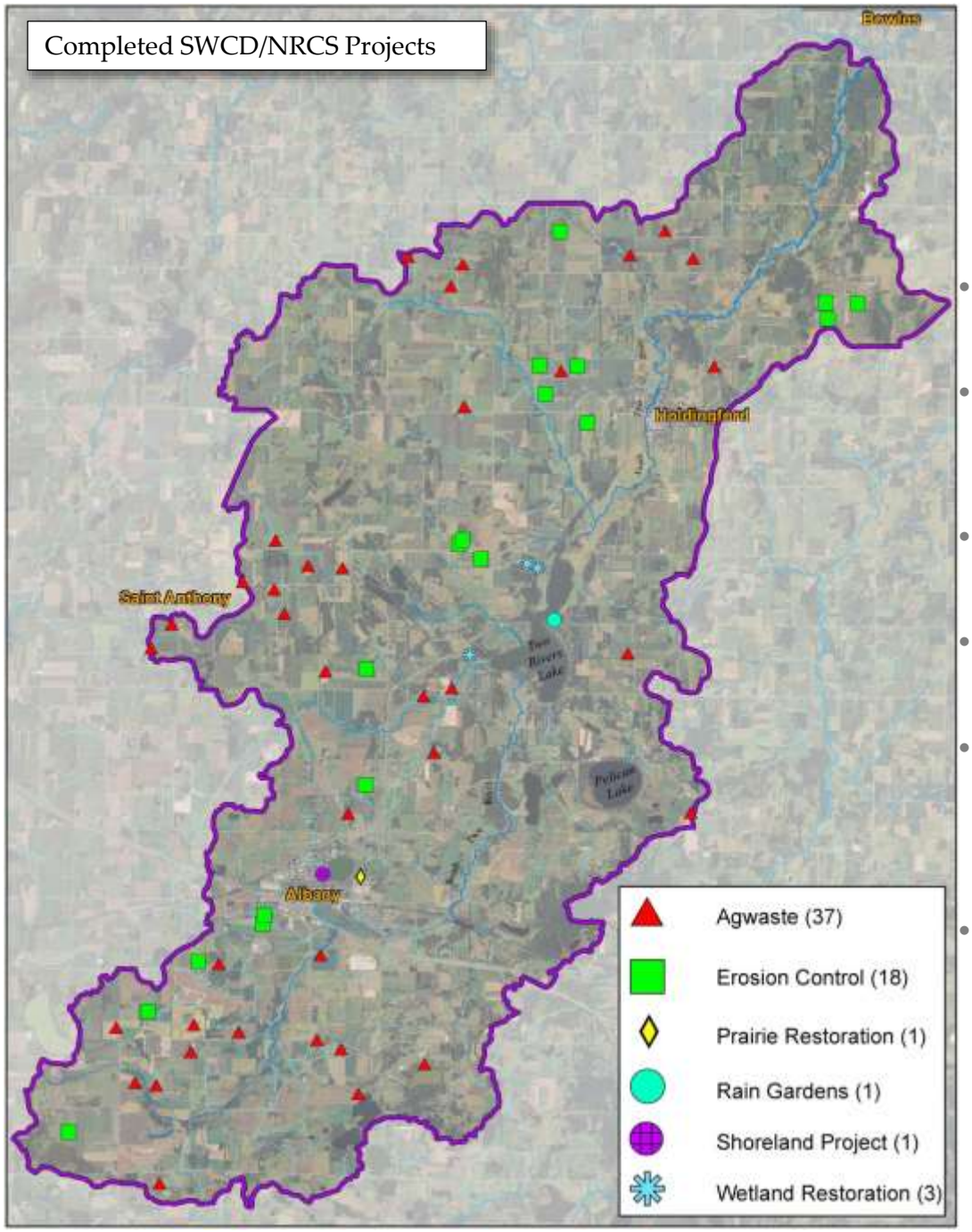
Wetlands/Hydraulic Modifications

- 4,000+ Acres of historic wetlands have been drained/modified for agricultural and residential development
- Due to ditching, tiling and other modifications
- Loss of natural water storage

South Two Rivers Focus Watershed

What Can be Done/What is Being Done?

- Options necessary to address the water and nutrient concerns will:
  - Store water
  - Slow water
  - Increase infiltration
- Some practices
  - Wetland restoration/creation
  - Modifications to farming practices
    - Cover crops, permanent vegetation, improve soil health
  - Water and sediment control basins
  - Raingardens
  - Infiltration basins
  - Buffer Strips



Two Rivers Watershed

What is Being Done?

- DNR continues to monitor lake levels and status of fishery
- Lake Association maintaining water quality monitoring program
- MPCA and City of Albany monitoring outputs from city
- MPCA working on TMDL process for Two Rivers Lake
- Stearns County SWCD has been working with ag community, lakeshore owners, and cities on voluntary projects
- Stearns County SWCD has applied for State Clean Water Funds to have a detailed study conducted to identify priority sites for projects in this area – Notification in Jan 2014

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- Wetland Restoration

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- Wetland Restoration

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- Wetland Restoration

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- Wetland Restoration

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- Grassed Waterway

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- Grassed Waterway

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- Grassed Waterway

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- Grassed Waterway

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- Two Rivers Park Wetland Restoration

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- Two Rivers Park Wetland Restoration

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- Two Rivers Park Wetland Restoration

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- Two Rivers Park Wetland Restoration

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- City of Albany North Lake Shoreland & Raingarden Project

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- City of Albany North Lake Shoreland & Raingarden Project

South Two Rivers Focus Watershed

Successful SWCD/NRCS Projects

- City of Albany North Lake Shoreland & Raingarden Project

South Two Rivers Focus Watershed

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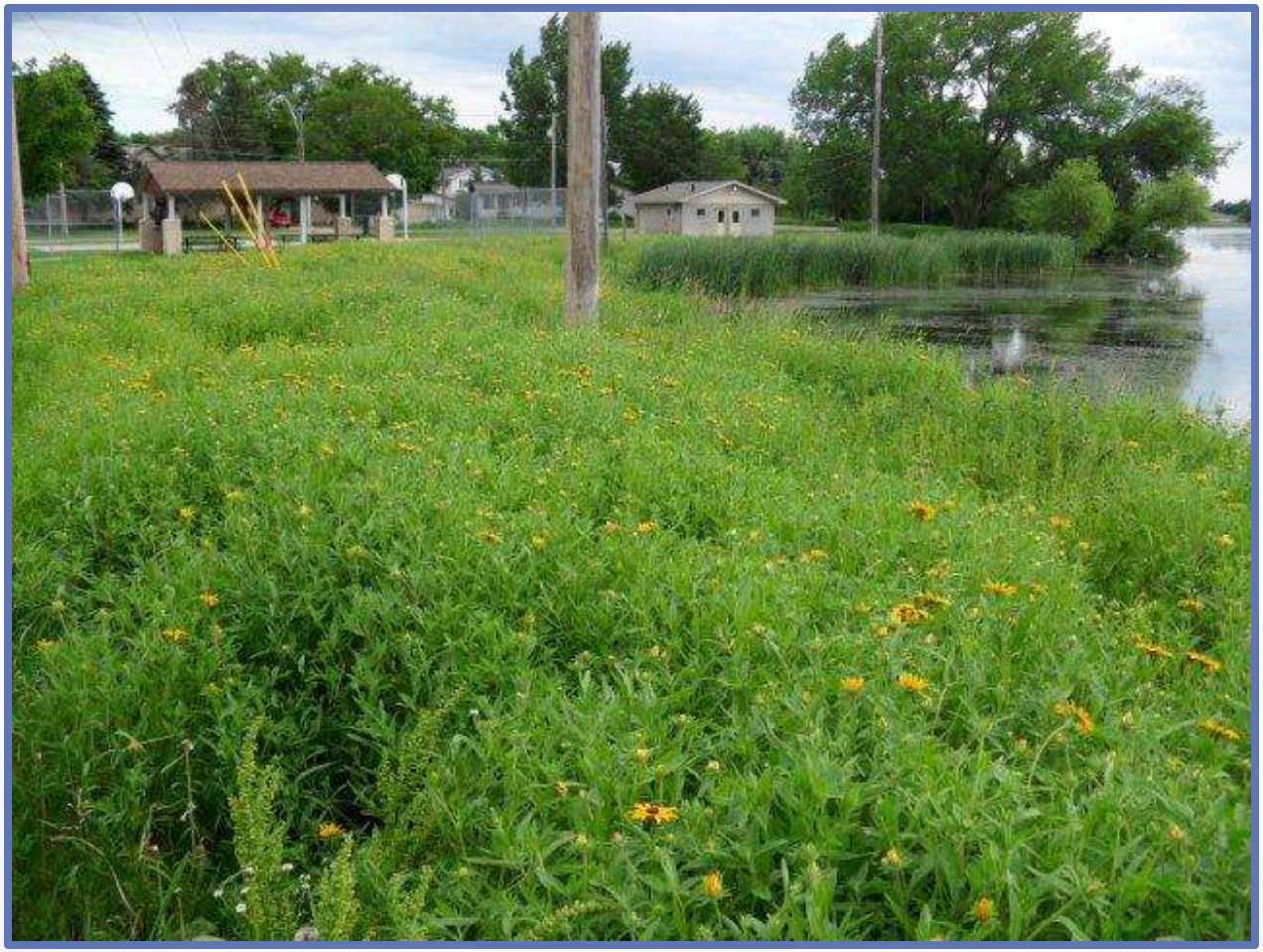
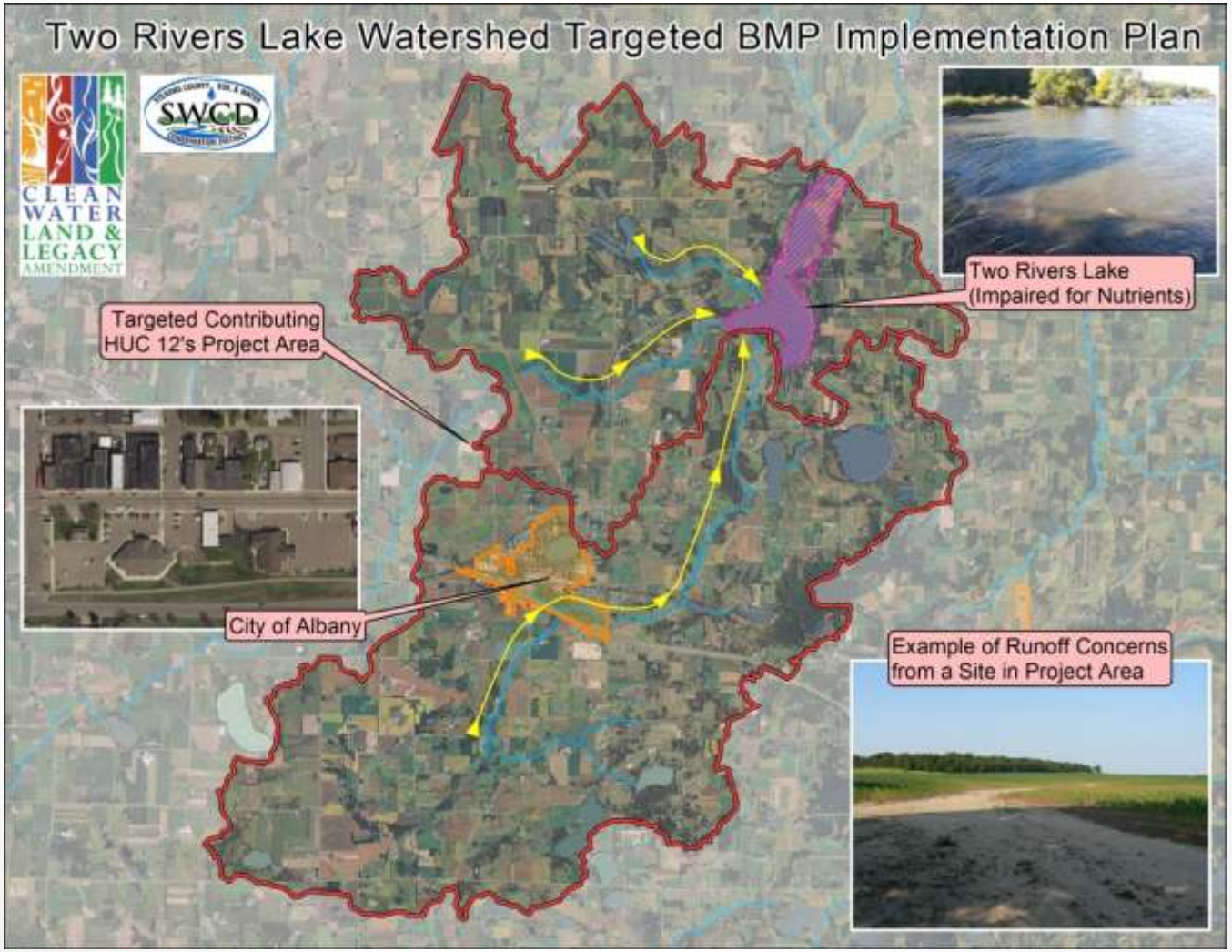


SWCD 2014 Clean Water Fund Application

"Two Rivers Lake Watershed Targeted BMP Implementation Plan"



SWCD 2014 Clean Water Fund Application

"Two Rivers Lake Watershed Targeted BMP Implementation Plan"

- Accelerate the implementation of conservation practices in area
- Create a high resolution targeting model using GIS mapping data (soils, Lidar, land cover, rainfall, etc.)
- Final output is:
  - Best Management Practices (BMP) Plan for the rural areas
  - Stormwater Best Management Practices (BMP) Plan for the City of Albany
- Use the plans for project prioritization and for pursing project funding going forward

South Two Rivers Focus Watershed

SWCD Erosion Concerns Outreach – Project Opportunities

- Maintaining a database of erosion concerns
- Follow up with letter and call

South Two Rivers Focus Watershed

SWCD Erosion Concerns Outreach – Project Opportunities

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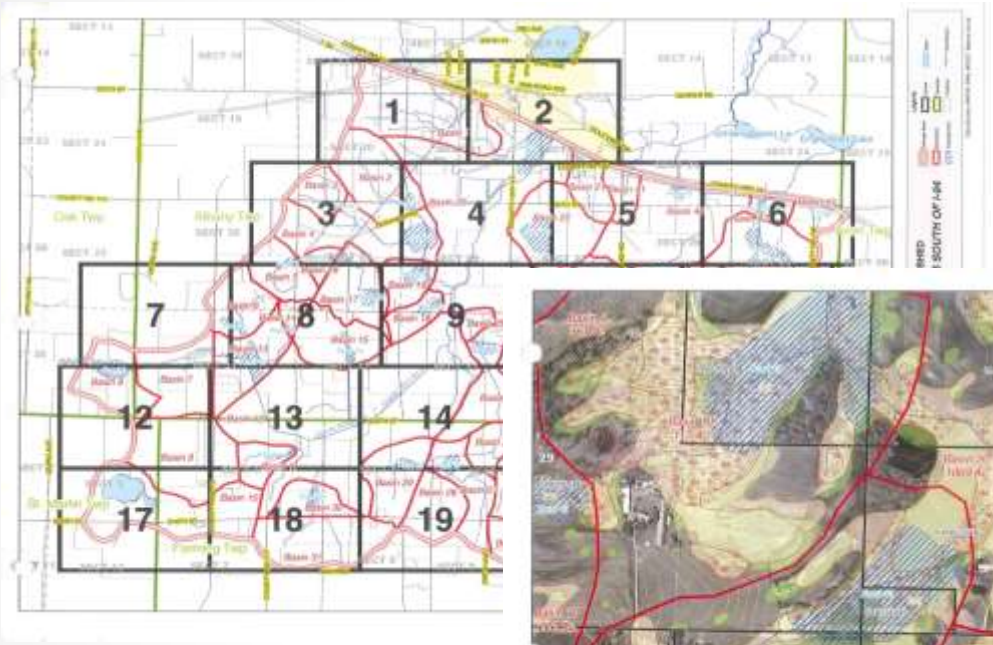
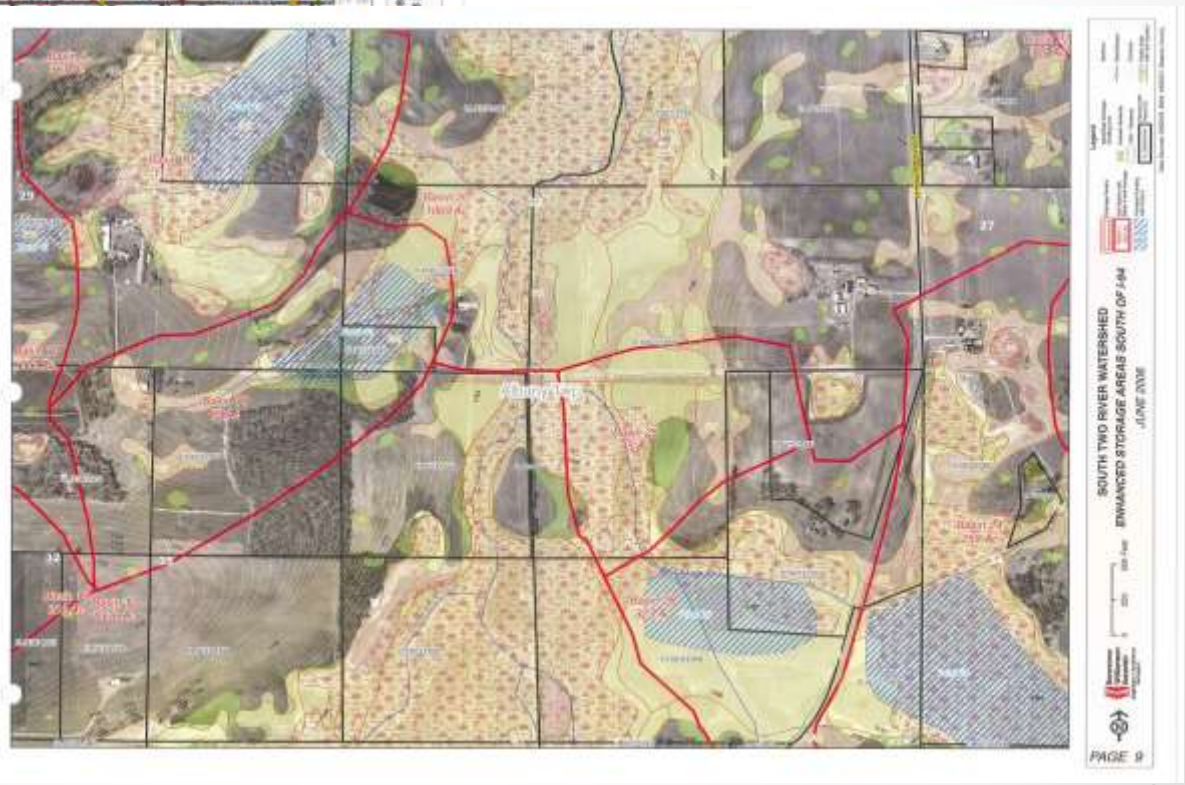
SWCD Erosion Concerns Outreach – Project Opportunities

South Two Rivers Focus Watershed

City of Albany Engineering – Potential Water Storage Study (South of I-94)





Stearns County Environmental Services

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