Briggs Chain of Lakes
2019 Fall Meeting

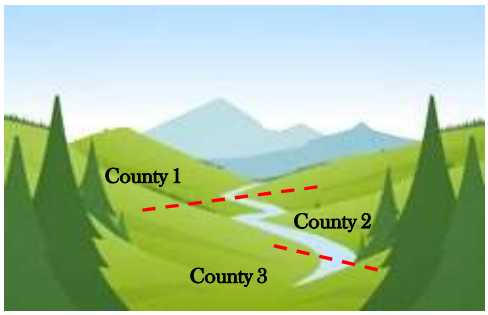
A Joint Meeting with BLCA, TLID and Sherburne SWCD
October 16, 2019

Meeting Agenda

1. Update on Watershed-Based Planning for Sherburne County
   - Watershed Monitoring
   - Restoration and Protection Strategy Development
   - Prioritization and Funding
2. Water Stabilization Study Update
   - Briggs Chain Water Quality Trends
   - 2019 Flow and Water Quality Monitoring
   - Potential Feasibility Study & Opportunities

Local Water Management Planning

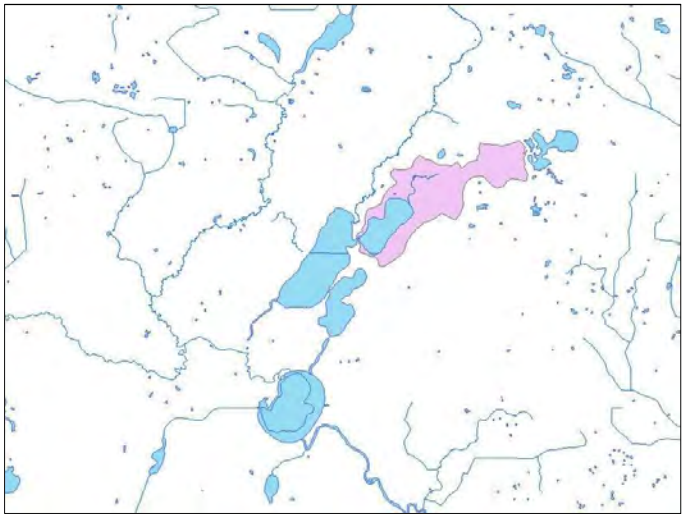
- Local water planning is OPTIONAL
- However, a county is required to have a water plan to be eligible for state funding
  - Water Plans identify the best and most effective projects & areas
- Currently, water planning is completed at a local level
  - County / District
  - Watershed District
  - Watershed Management Organization



The Watershed Concept

A roof is a very simple "watershed" – gravity allows collected water to be routed towards a specific point

Sherburne SWCD

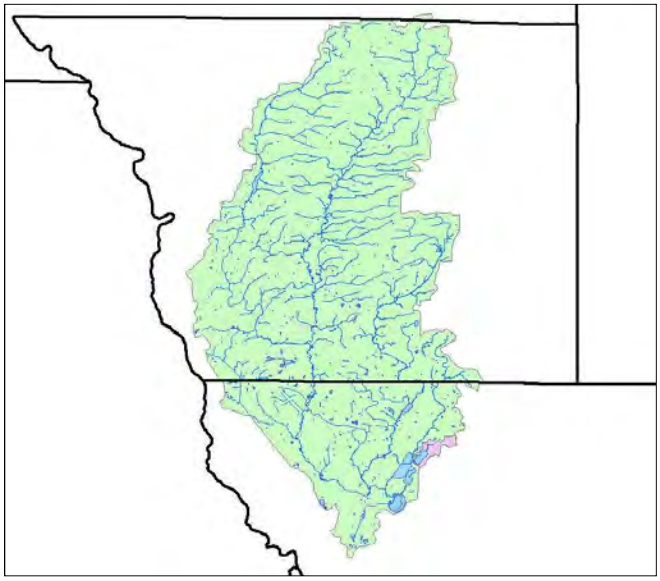


Julia Lake Watershed

725 acres
1.13 sq. miles

Sherburne County

Sherburne SWCD

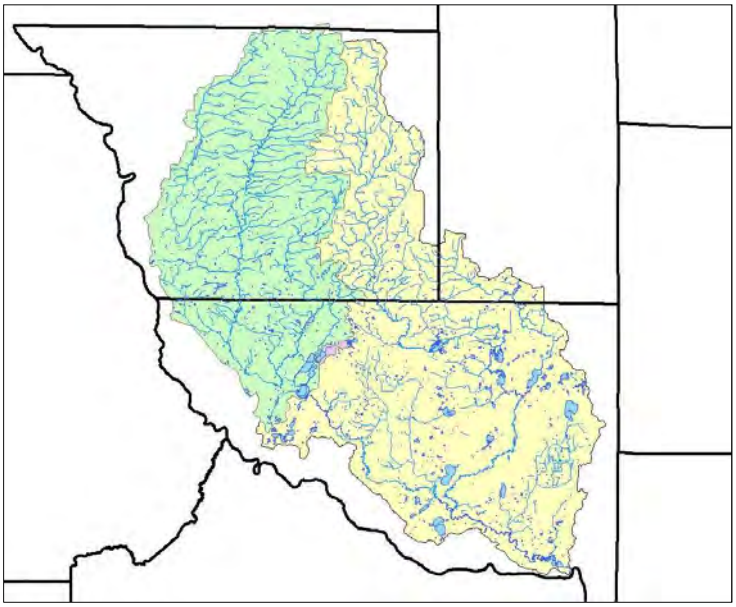


Elk Lake Watershed

152,484 acres
238 sq. miles

Benton and Sherburne Counties

Sherburne SWCD

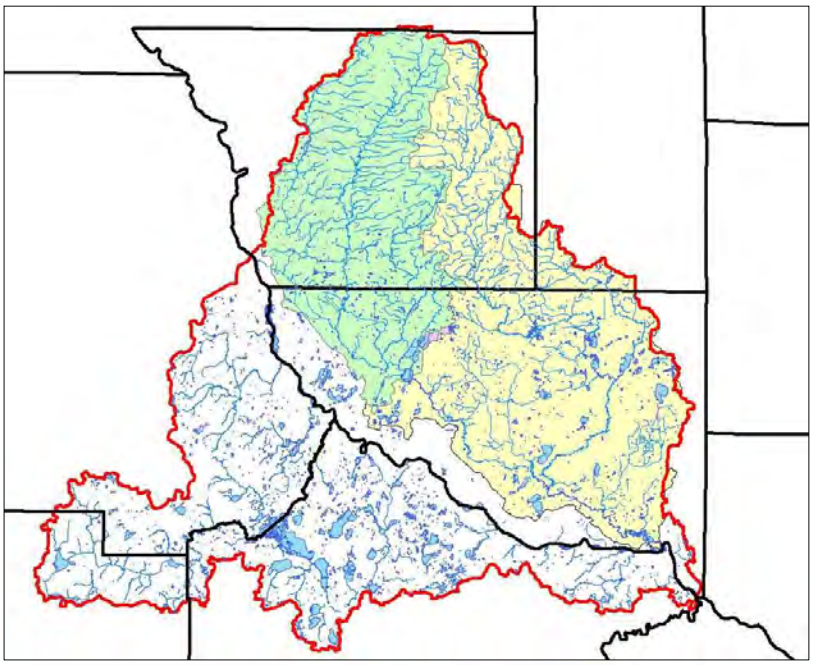


Elk River Watershed

392,320 acres
613 sq. miles

Benton, Mille Lacs and Sherburne Counties

Sherburne SWCD



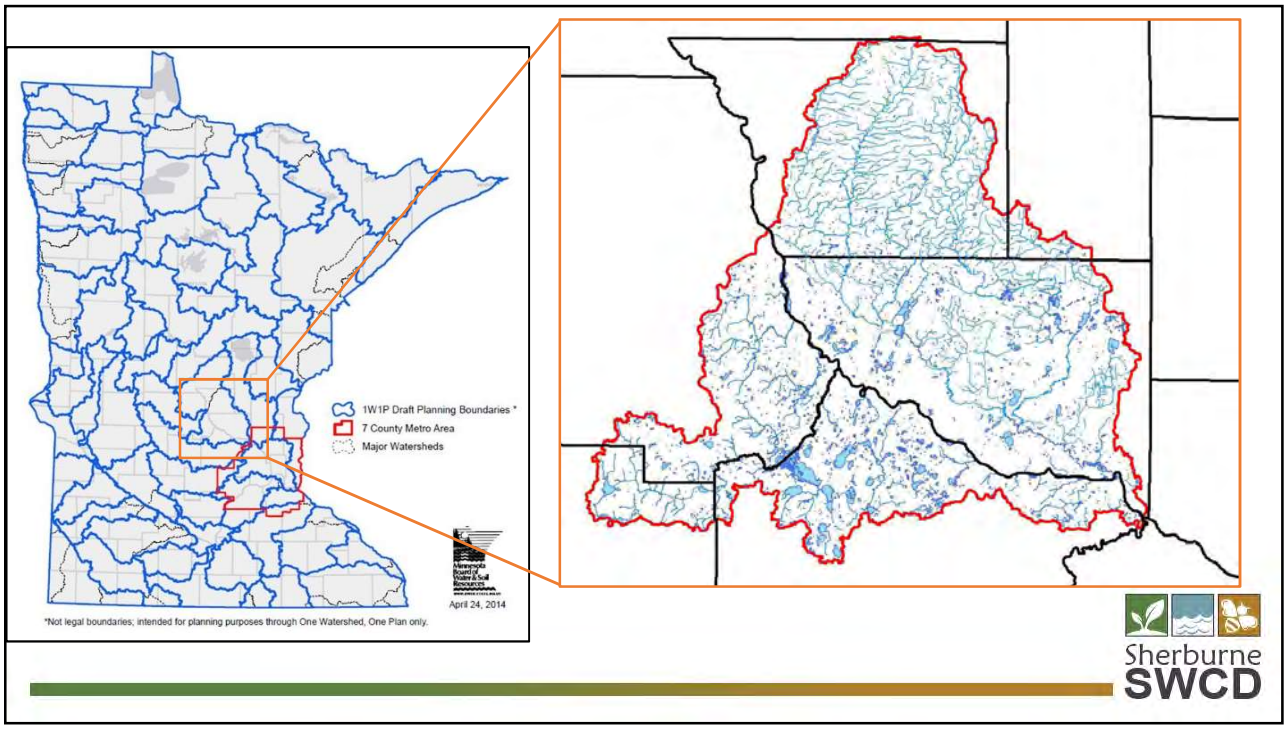
Mississippi River – St. Cloud Watershed

717,479 acres
1,121 sq. miles

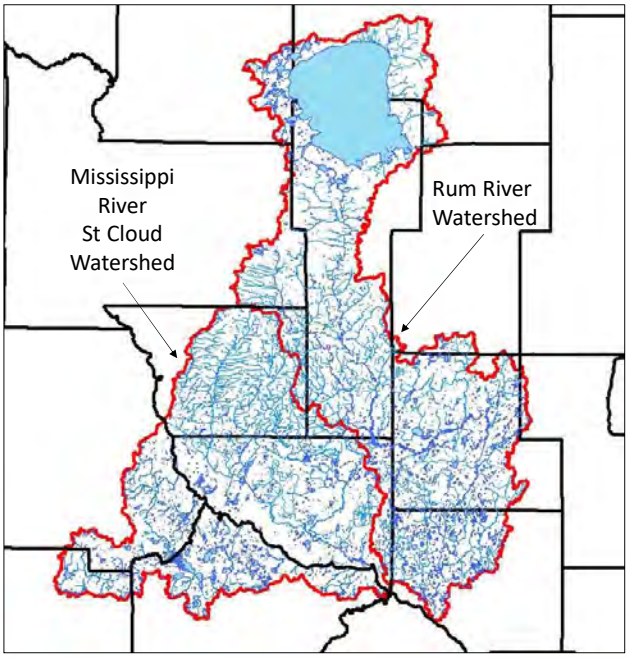
Benton, Stearns, Wright, Meeker, Mille Lacs and Sherburne Counties

Sherburne SWCD

Sherburne SWCD



Sherburne SWCD



Sherburne County shares major watersheds with:

- ***12 other Counties***
- ***2 Watershed Management Organizations***
- ***1 Watershed District***

Sherburne SWCD

Watershed-Based Planning: IWM

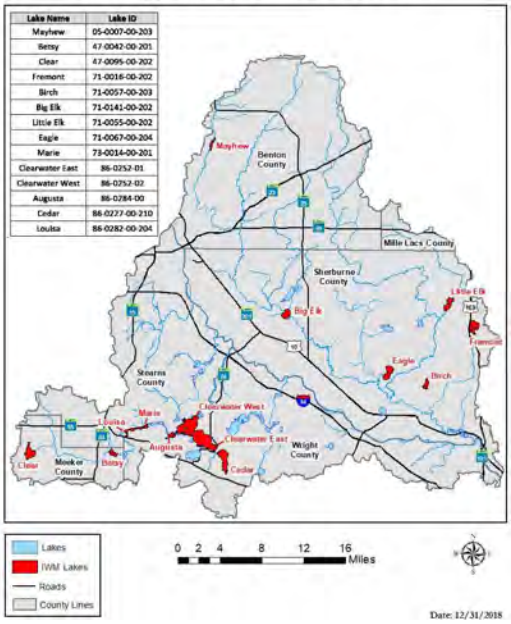
Intensive Watershed Monitoring

- Assess lake and stream conditions
  - Water Quality
  - Fish, Insects
  - Water condition
- Revisit every watershed ~10 years
- Produces data on quality of waters
- Provides substance for planning efforts

Photo: Sherburne SWCD

Mississippi River St. Cloud IWM Lake Sites

Lake Name	Lake ID
Mayhew	05-0007-00-203
Betsy	47-0042-00-201
Clear	47-0095-00-202
Fremont	71-0016-00-202
Birch	71-0057-00-203
Big Elk	71-0141-00-202
Little Elk	71-0055-00-202
Eagle	71-0067-00-204
Marie	73-0014-00-201
Clearwater East	86-0252-01
Clearwater West	86-0252-02
Augusta	86-0284-00
Cedar	86-0227-00-210
Louisa	86-0282-00-204

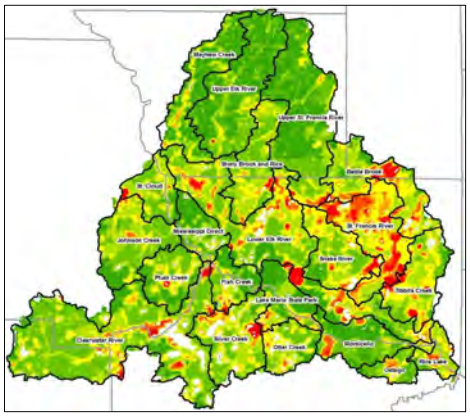


Mississippi River St. Cloud IWM Stream Sites

Watershed-Based Planning: WRAPS

Watershed Restoration & Protection Strategies

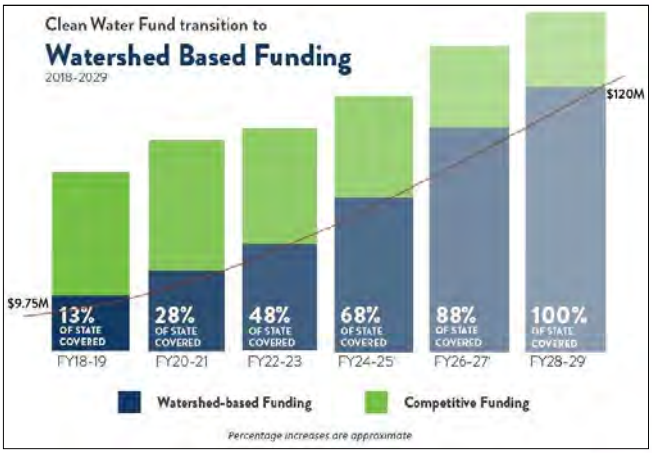
- Integrate data from IWM
- Establish priorities and goals for restoration
- Identify protection areas
- Develop action strategies to protect/restore
- Facilitates TMDL completion
- Revisit every watershed ~10 years

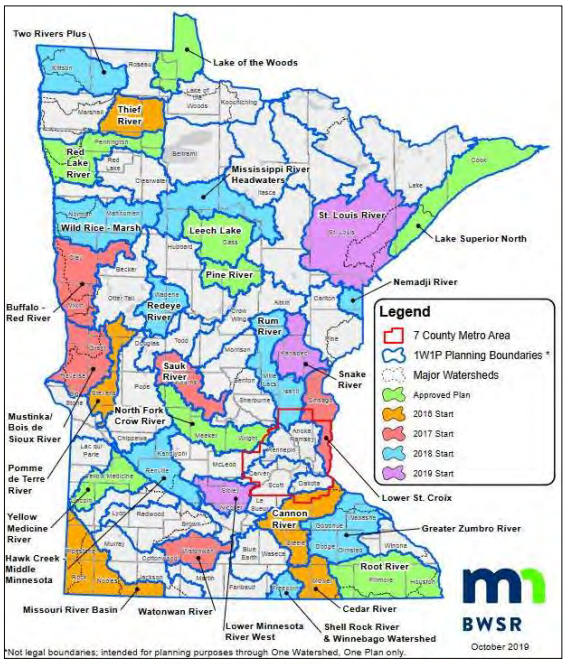


Watershed-Based Planning: 1W1P

One Watershed, One Plan

- Water plans at watershed level
  - Prioritized and targeted projects
  - Multiple benefits and downstream impacts
- Plan identifies specific areas, projects, pollution reductions and estimated costs
- Sustained and predictable funding





Sherburne SWCD

Sherburne SWCD

1W1P - Who is Involved?

Planning Team

- Several local agency staff who are the “heavy lifters” who keep the project on task

Steering Committee

- Local agency staff representing counties and SWCDs in watershed
- Guide process, ensure stakeholder input, develop plan materials as directed

Advisory Committee

- Approved by Policy Committee. Includes local staff, state agencies, local stakeholder groups (environmental groups, lake associations, agricultural community, cities, townships, etc.)

Policy Committee

- Decision making authority. Includes elected official from Counties and Soil & Water Conservation Districts

Watershed Planning Sequence

IWM

Intensive Watershed Monitoring

WRAPS

Watershed Restoration & Protection Strategies

1W1P

One Watershed, One Plan

Provides the science behind watershed condition

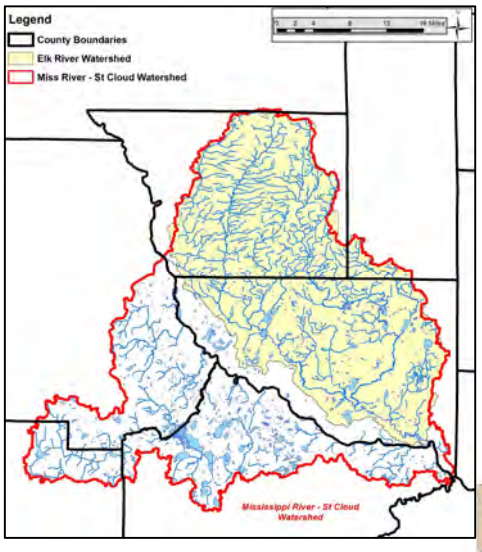
Determines the restoration and protection activities needed

Prioritizes and targets activities, sets funding framework

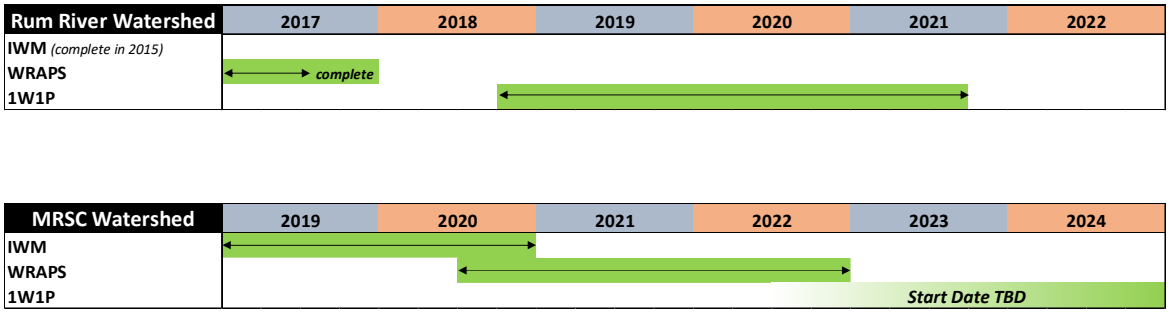
ERWA Transition

A watershed-based entity has existed for 25 years

- Elk River Watershed Association
  - Representatives from Benton and Sherburne Counties, Soil & Water Conservation Districts
  - No taxing authority, reliant upon competitive grant applications
  - Coordinated work between counties, within watershed
  - Will be dissolving at end of 2019, Sherburne County and SWCD favors transitioning to 1w1p



Watershed-Based Planning Timeline



Stakeholder Engagement Opportunities

IWM

- Citizen monitoring data supports program greatly!
- Several long-term monitoring partners contributing data
- Advanced studies help to pinpoint sources of pollution

WRAPS

- Open House opportunities with Phase I, again with Phase II?
- Local presentations on water quality data, trends, opportunities

1W1P

- Rum River Watershed – Isanti COLA is representing lake association interests, will reach out to ICOLA to attend a SCCOLA meeting with updates
- Mississippi River St Cloud – Participation by SCCOLA and/or Briggs Lake representatives on Advisory Committee would be appropriate

Water Stabilization Studies Update

Sherburne SWCD

Work in the Briggs Chain Watershed

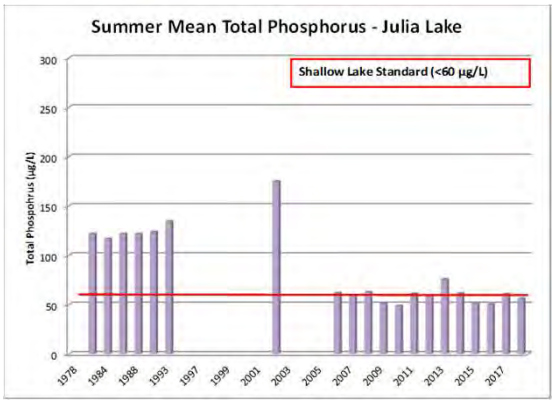
Briggs Chain Watershed (including Elk Lake) has been a priority watershed for conservation

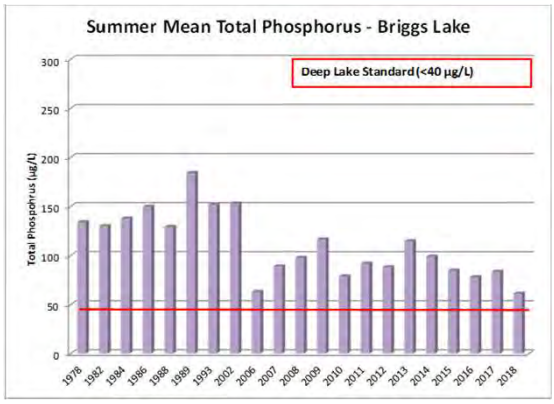
- Approximately 980 BMPs initiated in upstream areas from 2004-2018*
  - Coordinated efforts of Benton SWCD, Sherburne SWCD, NRCS and landowners
- Agricultural BMPs
  - Nutrient Management
  - Water & Sediment Control Basins
  - Grassed Waterways
  - Cover Crops
  - Buffer & Filter Strips
- Urban / Residential BMPs
  - Critical Area Planting
  - Stormwater mitigation
  - Stream / Shore protection


Photo: Sherburne SWCD

* *https://www.pca.state.mn.us/water/best-management-practices-implemented-watershed*

Lake Trends



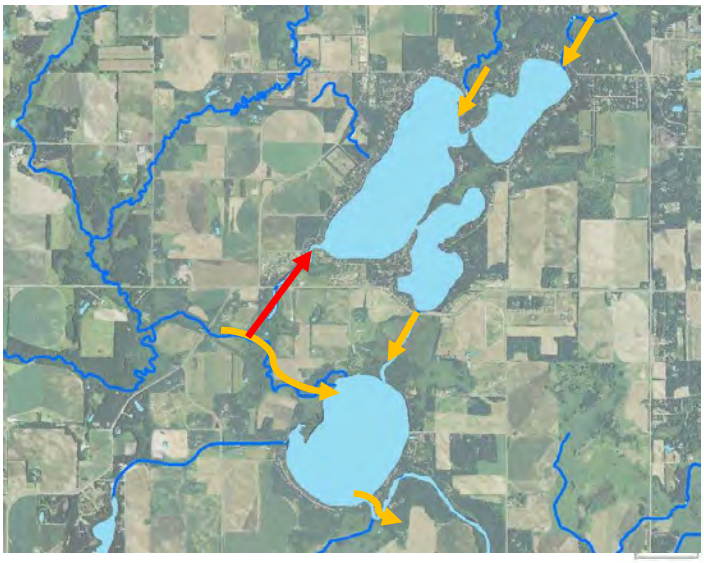


- All lakes listed as "impaired" for excessive nutrients.
- Phosphorus data indicates improving conditions in all four lakes.
- Julia Lake is hovering near/below the impairment threshold.

Briggs Chain Hydrology

Change in hydrology over time
- Clearing of vegetative cover
- Draining of wetlands
- Establishment of impervious and relatively impervious cover
- Results in faster runoff, quick accumulation of water in streams / lakes

How to address this?
- Increase vegetative cover
- Increase water storage & infiltration
  - Stormwater basins, wetlands, native plants



Water Stabilization Study Recap

Purpose: Assess causes of high water conditions and identify hydrologic alternatives

- Examined water level data, sub-watershed characteristics
- Identified several potential mitigation options
  - Upstream storage
  - Rush Lake outlet modification
  - Bayou inlet modification
- Identified data gaps
  - Survey data for several inlets / outlets
  - Lake level and river level stage data
  - Rating curves for several inlets / outlets

Bayou Monitoring, 2019

- Periodic flow velocity measurements
- Tape-down measurements (stream height)
- Water quality sampling
  - Precipitation events
  - Baseline conditions
- Funding provided by MPCA small-grant
  - MPCA staff (Paul Schrieber) collected flow data
- Much of data collected by several volunteers
  - Special thanks to Walt Munsterman, Gary Anderson and Mike Flanery!!!

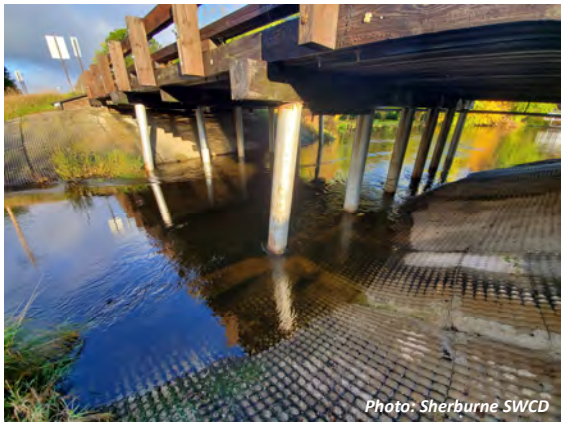


Photo: Sherburne SWCD

Bayou Monitoring Results – Flow & Stage

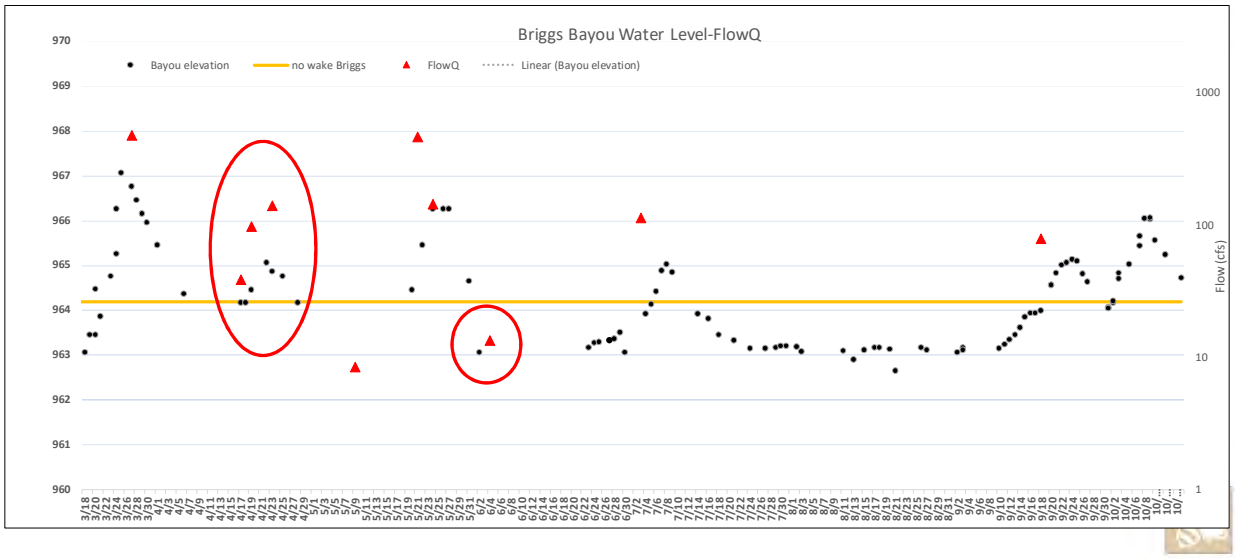
- Stage fluctuated nearly 4.5 feet over the summer
- Discharge varied from 0 cfs to 620 cfs*
- Slow-no-wake reached numerous times in 2019

Photo: Sherburne SWCD

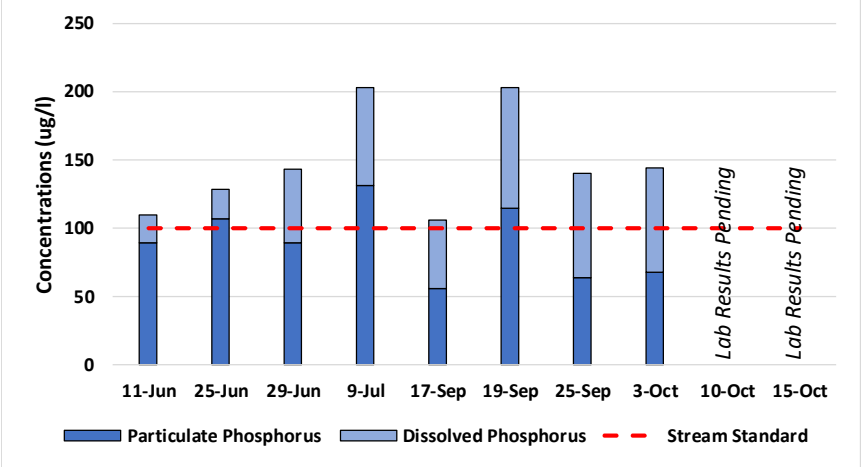

Photo: Mike Flanery

*1 cubic feet per second = 450 gallons per minute

Bayou Monitoring Results – Flow & Stage

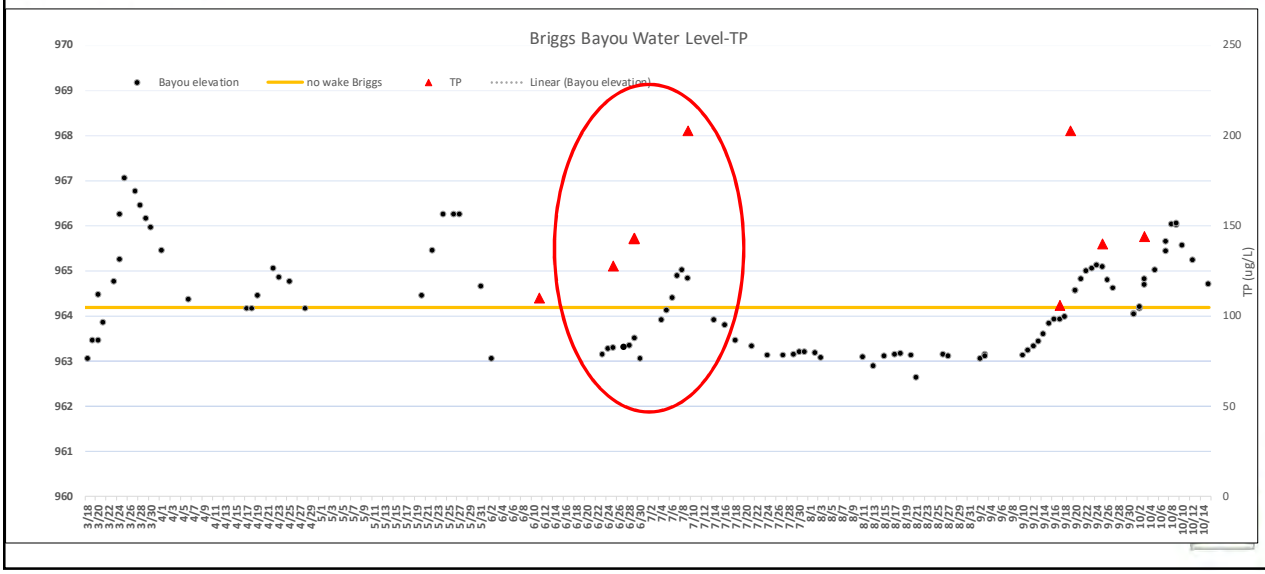


Bayou Monitoring Results – Water Quality



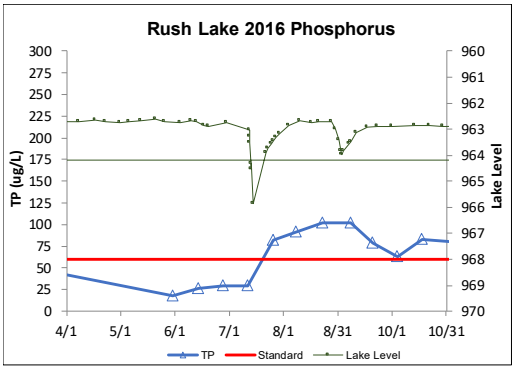
- Particulate Phosphorus + Dissolved Phosphorus = "Total Phosphorus"
- Total Phosphorus exceeded stream standard (100 µg/L) with every sampling event and at all flow conditions
- Mainstem Elk River generally averages 80-100 µg/L
- Bayou flows may transport nutrient rich water from terrestrial soils

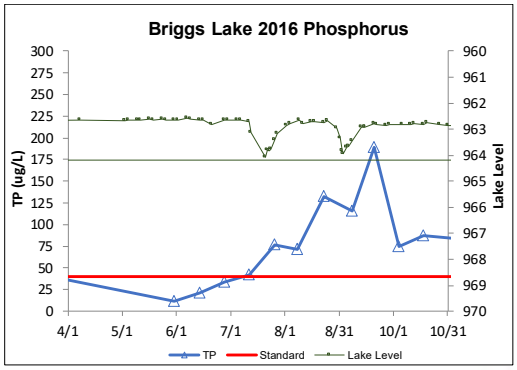
Water Quality & Water Level



Water Quality & Water Level

- Some correlation between lake level and high phosphorus
- Timing of sample collection, water flushing rate, and internal nutrient loading complicate this correlation a bit.





Graphs created by Wenck Associates, modified by Sherburne SWCD

Opportunities for Water Storage?

COUNTY LOOKING AT LAND FOR ANOTHER PARK.
9-21-19
Fri, 09/20/2019 - 3:34pm admin

Potential County Park offers unique opportunity

- Difficult to find land to place large BMPs
- Could provide water storage for flood events
- Could allow for settling of sediment & nutrients
- Could compliment park features and provide wildlife habitat
- No guarantee of project, not a "silver bullet"
  - County purchase is still preliminary, and any plans for a BMP on this site would need county approval

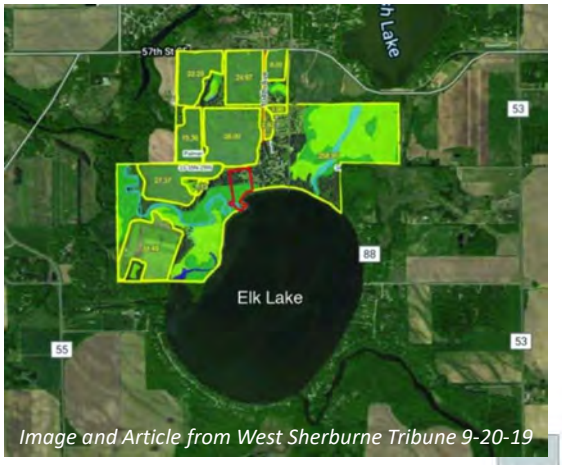


Image and Article from West Sherburne Tribune 9-20-19

Continued Work on Water Levels

Wenck Associates Proposed Work:

- Review and compile newly collected data
- Calibration and development of advanced Water Level Model
- Update model with new channel information, build fish barrier into model
- Run model scenarios
  - Existing
  - Fish barrier removal
  - 3 alternative design options for water storage

- Cost: roughly $12,000
- Sherburne SWCD would like to contribute $5,000 towards project, along with staff time for survey data collection and project participation.

Funding Opportunities

1. Continued water quality modeling provided through WRAPS process
   - Funds available through State of Minnesota (Pollution Control Agency)

2. BMP implementation could be potentially large-scale, quite expensive
   - Clean Water Funds grant (Clean Water Land & Legacy Amendment)
     - 75% Cost Share, three year term
     - Could fund majority of project
   - 1W1P Priority Funding
     - Following completion of 1w1p project
     - Project could rank high due to multiple benefits and multiple waters impacted
   - Conservation Partnership Legacy
     - 90% Cost Share
     - Must restore or enhance wildlife habitat – applicability depends upon project type

Conclusions

- Watershed-based planning will benefit Briggs Chain and downstream waters
- Briggs Chain lakes water quality is trending in right direction
- New data sheds light on Bayou flow patterns during a “wet” year
- Bayou water quality data provides better understanding of impacts to lake water quality
- Additional diagnostic / feasibility analysis is required
  - To what degree would flooding be mitigated in Briggs Chain lakes?
  - How would downstream water levels be impacted?
  - How would water quality be impacted?
- Implementation could be expensive, but if studies show impacts substantial a good chance for grant funding exists

Questions?

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