

By Corey Hanson, Red Lake Watershed District Water Quality Coordinator. 11/26/2018.

- ✓ Monitoring Results
- ✓ Clearwater River Watershed Restoration and Protection Strategy Project
- ✓ Bartlett Lake
- ✓ River Watch

Red Lake Watershed District Long-Term Monitoring Program

The first 2018 round of samples were collected for the District's long-term monitoring program in May.

High concentrations of *E. coli* bacteria were found at:

- Browns Creek at CR 101
- Ruffy Brook at CSAH 11
- Chief's Coulee at Dewey Ave in northern Thief River Falls
- Thief River at CSAH 7
- Darrigan's Creek
- O' Briens Creek
- Coburn Creek
- North Cormorant River at CSAH 36
- Walker Brook at CSAH 19
- Nassett Creek
- Silver Creek at 159th Ave, west of Clearbrook (cattle in the stream)



Cattle in Silver Creek, near Clearbrook

High concentrations of total suspended solids were found at:

- Clearwater River at CSAH 24 upstream of Clearwater Lake (>10 mg/L)
- Clearwater River at CSAH 14 (>15 mg/L)
- Chief's Coulee at Dewey Ave in northern Thief River Falls (122 mg/L)
- Branch A of Judicial Ditch 21
- Silver Creek at 159th Ave, west of Clearbrook (cattle in the stream)

There was a large increase in total suspended solids (TSS) between the CSAH 20 crossing of RLWD Ditch 15 and the County Road 62 crossing of Polk County Ditch 2. The TSS concentrations in the lower Red Lake River at East Grand Forks were relatively low, less than the 65 mg/L TSS standard, and some were in the single-digits. The Thief River met the 30 mg/L TSS standard. A very low TSS concentration (<1 mg/L) was found in Cyr Creek.

High concentrations of total phosphorus were found at:

- Chief's Coulee at Dewey Ave in northern Thief River Falls
- Grand Marais Creek at 130th St NW **and** 110th St NW
- Darrigan's Creek
- O' Briens Creek
- Coburn Creek
- Blackduck River
- South Cormorant River
- North Cormorant River
- Poplar River at 310th St SE **and** CSAH 30 near Fosston
- Hill River at 335th Ave SE **and** CSAH 35
- Clearwater River at CSAH 24 upstream of Clearwater Lake
- Nassett Creek
- Lost River at 109th Ave, upstream of Pine Lake
- Silver Creek at 159th Ave, west of Clearbrook (cattle in the stream)

The East Polk SWCD began sampling lakes within Polk County. Within the Red Lake Watershed District, they will be sampling Cameron Lake, Hill River Lake, Cross Lake, Oak Lake, Spring Lake, Turtle Lake, Badger Lake, Whitefish Lake, and Poplar Lake.

A plan was compiled for the installation of dissolved oxygen loggers throughout the District. The plan schedules deployments for each year so that as many significant reaches as possible are characterized by continuous dissolved oxygen data in a ten-year period. Two deployments in two separate years were planned for streams and rivers with high concentrations of total phosphorus to fulfill the MPCA's minimum data requirements for the dissolved oxygen fluctuation standard for assessments of river eutrophication.

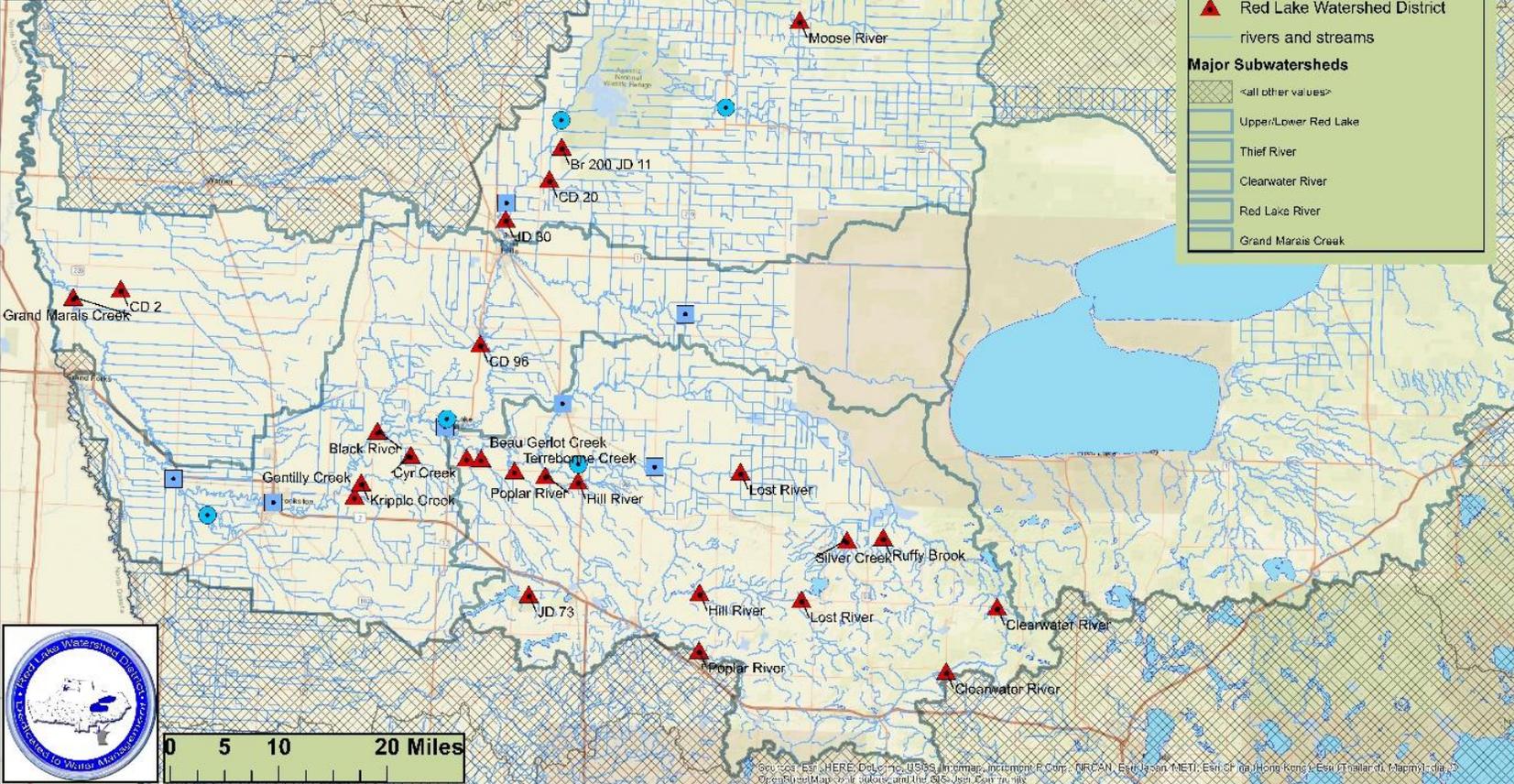
Red Lake Watershed District Flow Monitoring Program

Deployment of water level loggers for the 2018 monitoring season was completed in May.

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Red Lake Watershed District 2017 Stage and Flow Monitoring Sites



Legend

Flow Monitoring

Flow

- USGS
- MPCA/DNR Cooperative Gauging
- Red Lake Watershed District
- rivers and streams

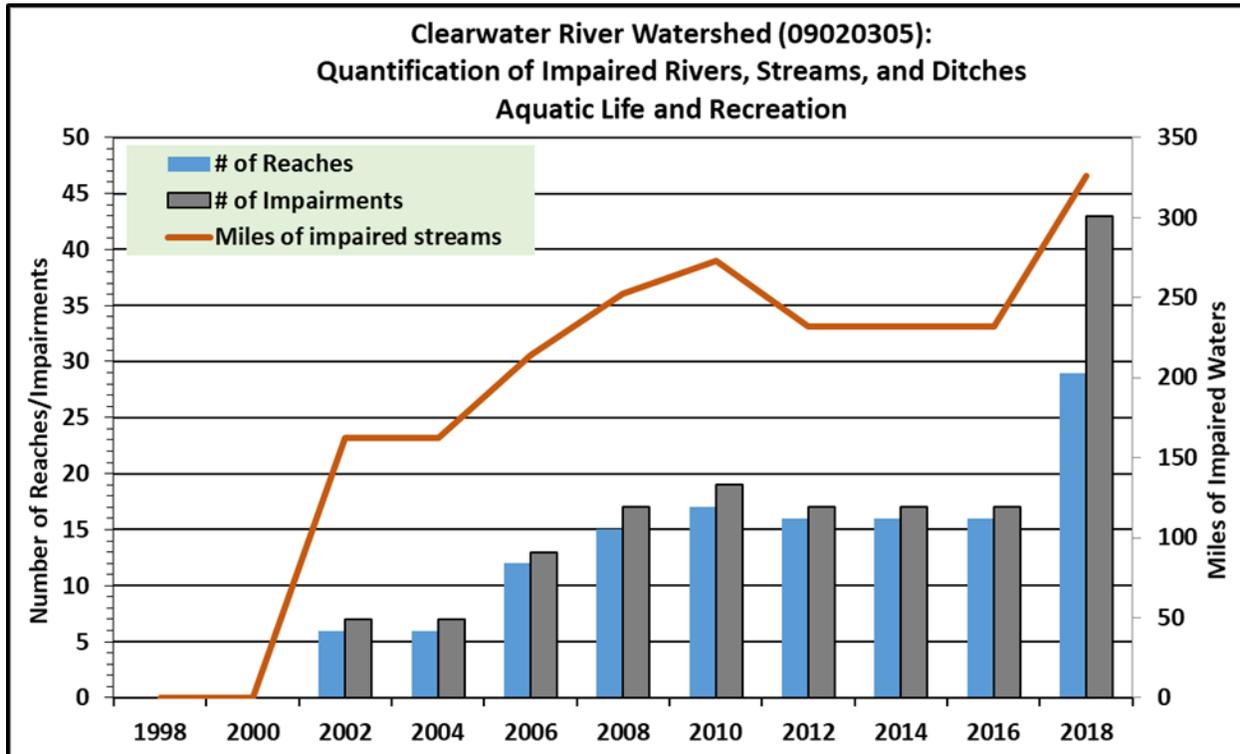
Major Subwatersheds

- <all other values>
- Upper/Lower Red Lake
- Thief River
- Clearwater River
- Red Lake River
- Grand Marais Creek

Source: Esri, HERE, DeLorme, USGS, Imagery, Mapbox, Swisstopo, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), Swisstopo, OpenStreetMap contributors, and the GIS User Community

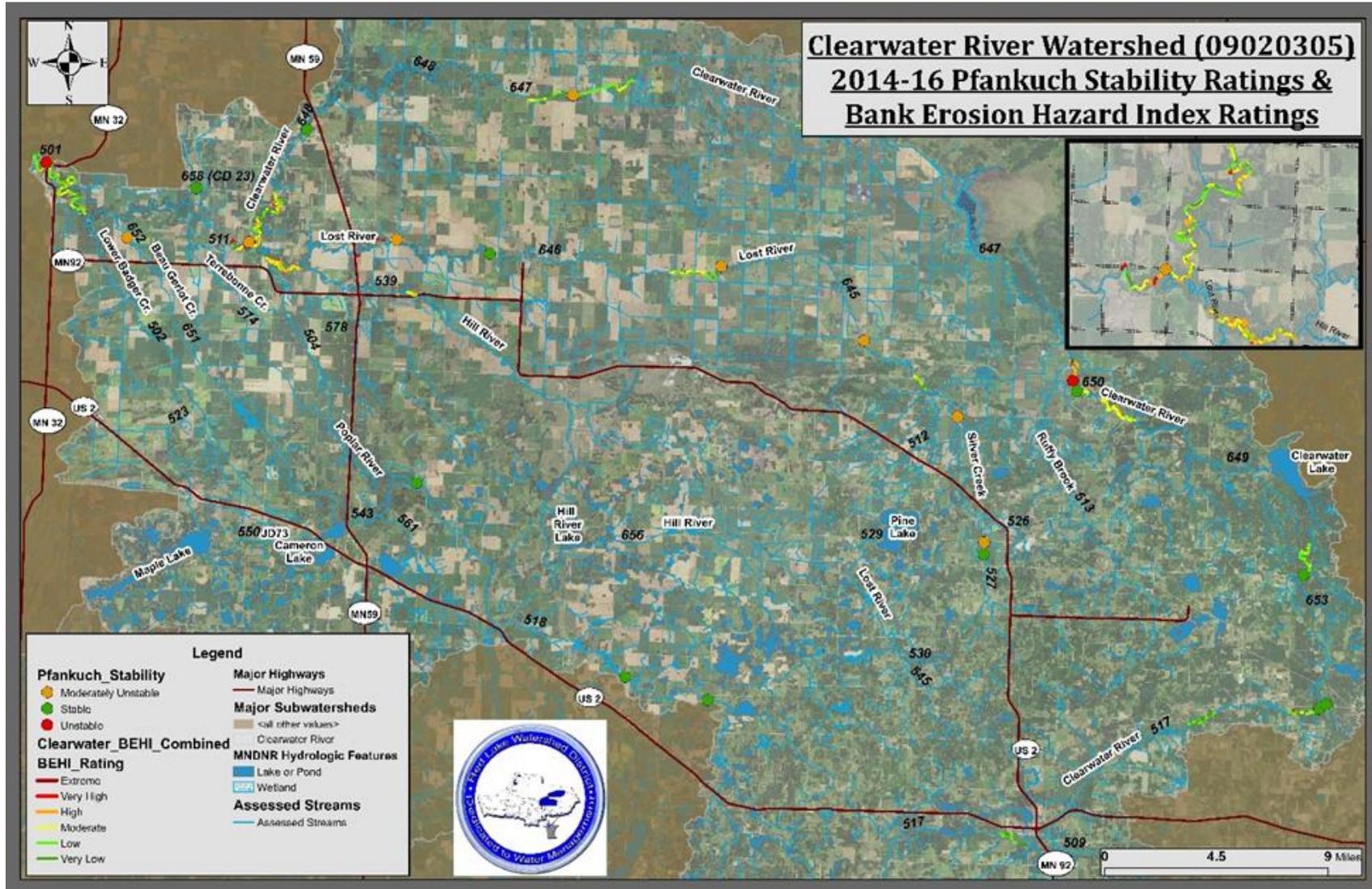
Clearwater River Watershed Restoration and Protection Strategy (WRAPS) Project

- Objective 5 – Stream Channel Stability Assessment
 - Clearwater River Bank Erosion Hazard Index (BEHI) lines and results were converted from a Google Earth (kmz) format to GIS shapefiles.
- Objective 10 – Report Writing
 - Progress was made on writing sections of the Clearwater River Total Maximum Daily Load report
 - Executive summary section
 - Subwatershed classification
 - Introductory text for the lakes characterization section
 - Lake drainage area and morphometry table
 - Stream characterization
 - Land use section
 - Current and historical water quality in the Clearwater River Watershed
 - Water quality trend summary table
 - Clearwater River nonpoint total suspended solids sources
 - Stressors of aquatic life in Silver Creek
 - Seasonal variation of total suspended solids and flow



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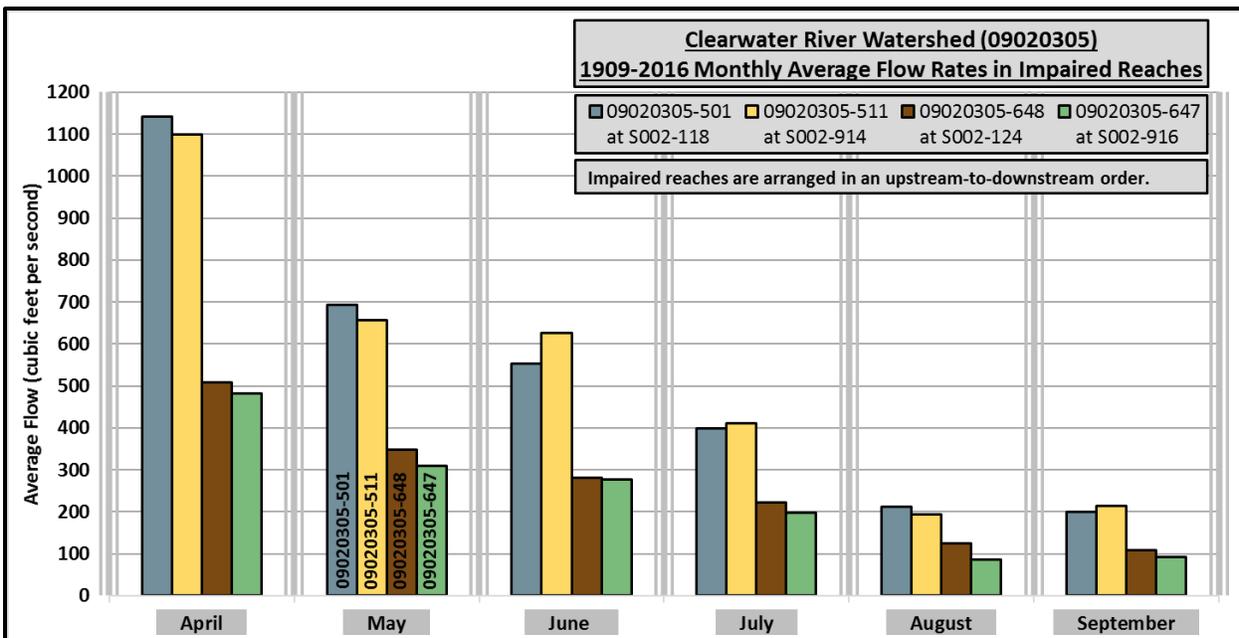
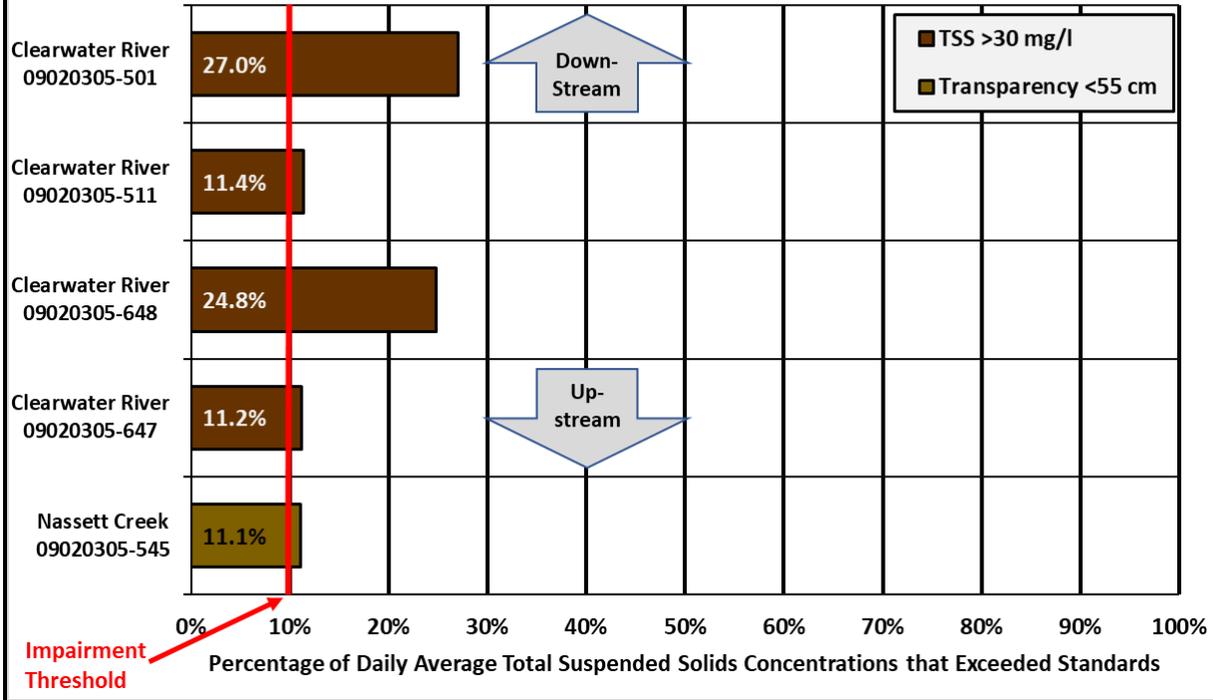
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AUID	Stream Name	SITE	Impaired Parameter	Years	Trend of Annual Averages	Trend of Summer Averages (May-Sept)
09020305-501	Clearwater River	S002-118	TSS	1990-2016	↑	↑
09020305-511	Clearwater River	S002-914	TSS	1992-2016	↓	↓
09020305-648	Clearwater River	S002-124	TSS	1992-2016	X	X
09020305-513	Ruffy Brook	S007-848 S008-057 S002-120	<i>E. coli</i>	2005-2016	X	X
09020305-527	Silver Creek	S002-082 S001-020	<i>E. coli</i>	2005-2016	↑	X
09020305-647	Clearwater River	S003-174	TSS	1998-2016	↑+	↑+
09020305-517	Clearwater River	S001-906	DO	1987-2015	↑	↑
09020305-517	Clearwater River	S001-458	DO	1992-2016	↑	X
09020305-543	Poplar R Diversion	S002-129	DO	1991-2016	↑	↑
09020305-504	Poplar River	S002-117 S007-608	<i>E. coli</i>	1992-2016	↑	↑
09020305-518	Poplar River	S002-091	DO	1991-2016	↑	↑
09020305-518	Poplar River	S003-127	DO	2001-2016	X	X
09020305-539	Hill River	S002-134	<i>E. coli</i>	2007-2016	X	X
09020305-512	Lost River	S001-007	<i>E. coli</i>	2005-2016	<10 data pts.	<10 data pts.
09020305-529	Lost River	S002-087 S005-283	<i>E. coli</i>	2005-2016	X	<10 data pts.
09020305-529	Lost River	S002-087 S005-283	DO	1992-2016	X	X
09020305-526	Clear Brook	S004-044	<i>E. coli</i>	2007-2016	<10 data pts.	<10 data pts.
09020305-526	Clear Brook	S004-044	DO	2004-2016	↑	↑+
09020305-509	Walker Brook	S002-122	DO	1992-2016	↓+	↓+
X = No Trend = Upward Trend (Getting Worse) = Strong Upward Trend (Getting Significantly Worse) = Downward Trend (Improvement) = Strong Downward Trend (Getting Significantly Better)						

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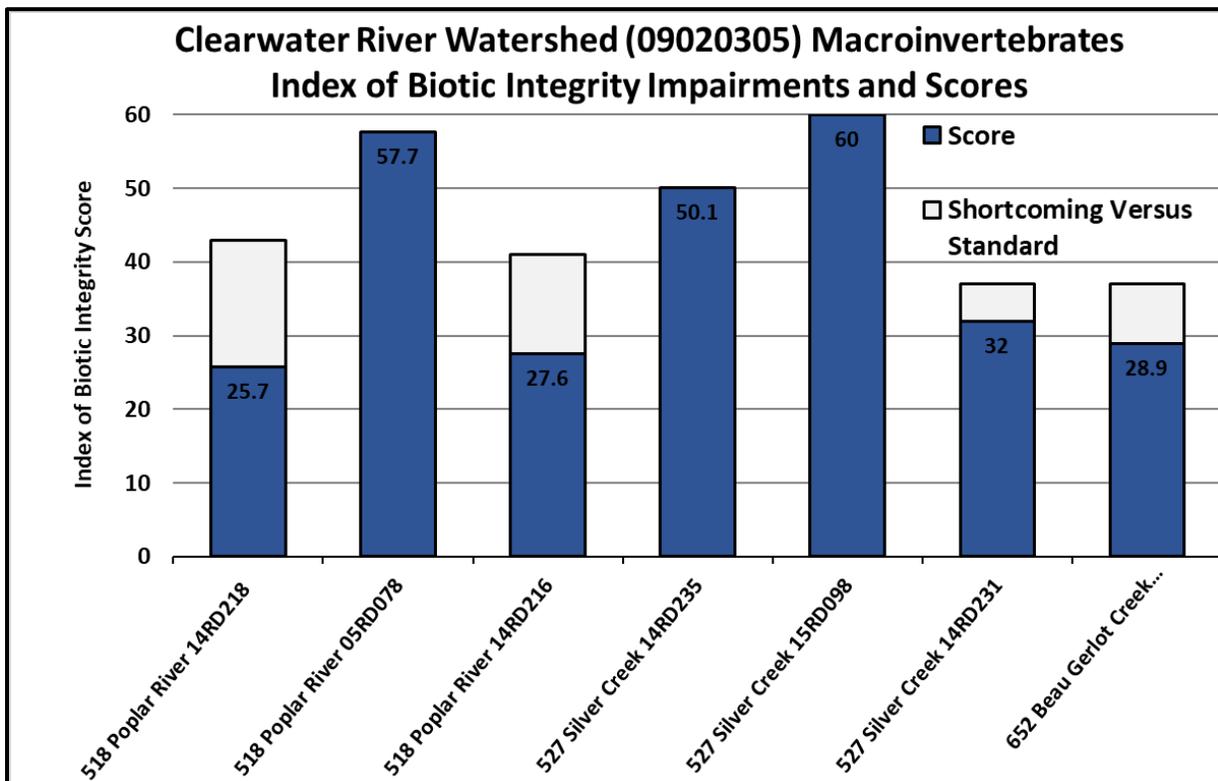
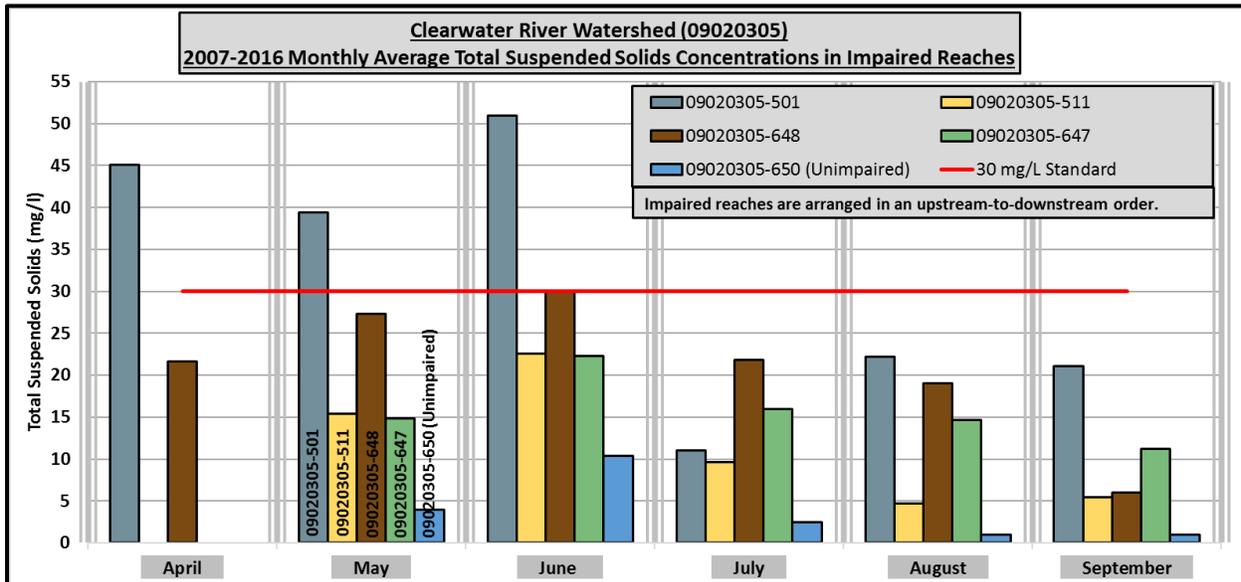
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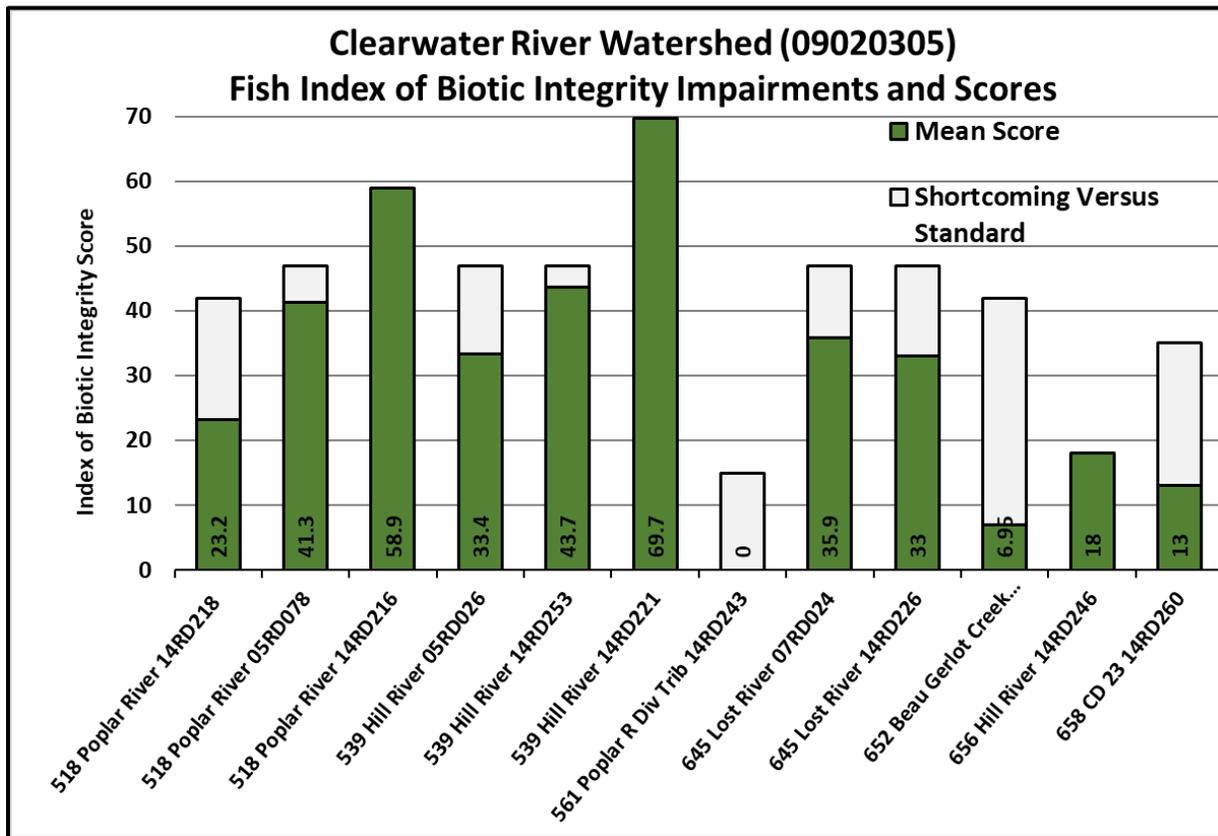
Clearwater River Watershed (09020305) Total Suspended Solids Rates at which 2007-2016 Data Exceeds Applicable Standards



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River Watch

The month of May was busy for River Watch and River of Dreams. River of Dreams is a cross-curriculum watershed education program tailored to elementary students. Participants learn watershed terminology and how their subwatershed fits into the Red River Basin through the design and real-life launch of a 14" cedar canoe.

- May 7, 2018 – River of Dreams canoe launch for Clearbrook-Gonvick elementary students
- May 8, 2018 – River of Dreams classroom instruction for Win-E-Mac elementary students
- May 9, 2018 – River of Dreams canoe launch for Red Lake Falls elementary students
- May 10, 2018 – River of Dreams canoe launch for Grygla elementary students
- May 11, 2018 – River of Dreams classroom instruction for Red Lake County Central elementary students
- May 15, 2018 – River of Dreams canoe launch for Win-E-Mac elementary students
- May 16, 2018 – Red Lake County Central students installed an informational kiosk in People's Park in Plummer
- May 22, 2018 – Red Lake County Central River Watch monitoring
- May 22, 2018 – River of Dreams canoe launch for Red Lake County Central elementary students

River of Dreams



Fun Facts

- Clearwater River starts in Ebro, MN and flows all the way to Red Lake Falls, MN
- Supplies water to local rice paddies
- Gives people access to tubing, fishing, boating, and kayaking
- Takes a minimum of 2 hours to travel by kayak from Peoples Park to Highway 1
- River runs from Peoples Park to Red Lake County 1 bridge

Places of interest

- People's Park -Plummer
- Plummer Corner Bar
- Cenex -Plummer/Oklee
- Plummer Co-op
- Seven Clans Casino -TRF
- Plummer Legion
- Pioneer Museum -Plummer

We appreciate the community officials for placing restrooms in Oklee and Plummer parks! We as a community would like to thank Enbridge for constructing shelters and boat launches at both locations.

**Welcome to the
Clearwater River
Kayak Launch and
Rest Area!**



One of the signs that will be on the kiosk made by the RLCC River Watch students

Bartlett Lake In-Lake Management Strategies

Bartlett Lake is a shallow lake by Northome that has been affected by long-term pollution from the city sewer and a creamery. Excess nutrients have caused the lake to become eutrophic. Emmons and Olivier Resources, Inc (EOR) conducted an analysis of potential in-lake management strategies to improve water quality in the lake. Unfortunately, there are no quick-fix solutions to the problem. The consultant concluded that Alum treatments would be ineffective. The report primarily suggested that manipulation of biology in the lake could lower algae levels in the lake. Winter aeration and the stocking of gamefish like northern pike were recommended. The northern pike would help reduce panfish populations. Panfish feed on zooplankton, so reducing panfish populations will increase zooplankton populations. Zooplankton feed on algae, so increasing zooplankton populations will keep algae populations in check.

Thief River One Watershed One Plan (1W1P)

District staff gathered and shared GIS layers with MN DNR staff that were working on a zonation process for the Thief River watershed, including a GIS layer of BANCS model results from the Thief River Watershed Fluvial Geomorphology Study. The Thief River HSPF-SAM tool was used to estimate the amount of pollutants that are coming from different sources. Pollutant loading estimates were extracted from the model for subwatersheds without long-term flow monitoring data. The Thief River 1W1P policy committee, planning work group, and advisory committee met in Grygla on May 9, 2018. District staff reviewed a draft Section 3 of the Thief River 1W1P document. District staff provided specific numbers to aid the development of measurable goals including flow statistics from the HSPF model, Minnesota Stream Habitat Assessment scores, index of biological integrity scores, and other specific goals.

Thief River Watershed Restoration and Protection Strategy (WRAPS)

The MPCA continued working on a review of the Thief River WRAPS and TMDL reports.

Upper/Lower Red Lakes Watershed Restoration and Protection Strategy (WRAPS)

The Upper/Lower Red Lakes Fluvial Geomorphology Report is now available online at <https://wrl.mnpals.net/islandora/object/WRLrepository%3A2957>.

The Upper/Lower Red Lake Watershed Monitoring and Assessment Report is available online at <https://wrl.mnpals.net/islandora/object/WRLrepository%3A740>.

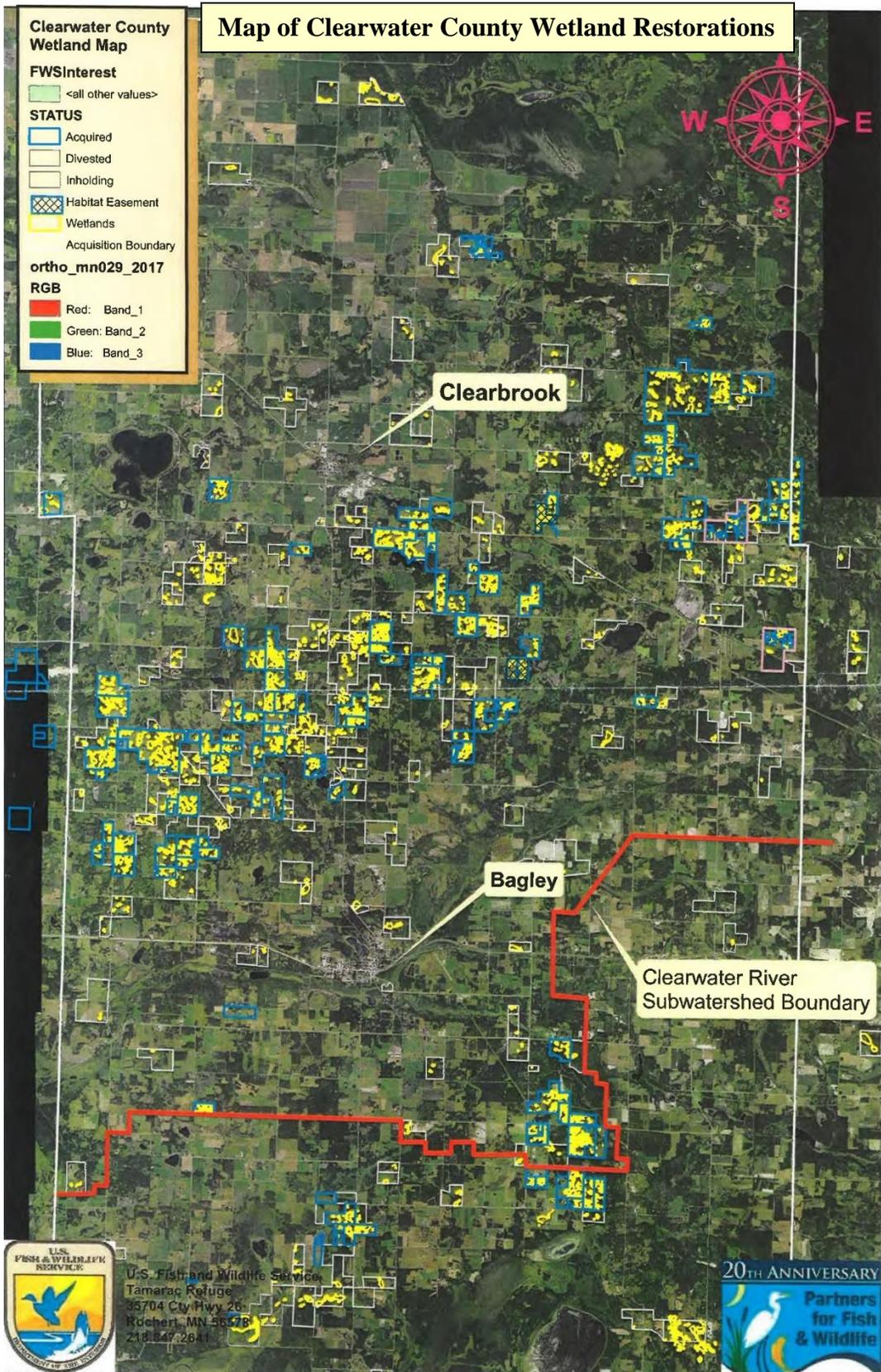
Other Notes

- Water quality related notes from the May 10, 2018 Red Lake Watershed District Board of Managers meeting:
 - The Board approved the Grant Agreement in the amount of \$677,551 with the Minnesota Board of Water and Soil Resources for the Red Lake River 1W1P.

- Water quality related notes from the May 24, 2018 Red Lake Watershed District Board of Managers meeting:
 - District and Houston Engineering, Inc. staff met with Brad Dokken, Outdoor Writer for the Grand Forks Herald, to tour the Grand Marais Creek Outlet Restoration on May 21st, 2018. An article will appear in the Grand Forks Herald in mid to late June.
 - District staff met with various BWSR Clean Water Specialists to discuss the grant process through BWSR, 1W1P process and projects funded by the Clean Water Council.
 - The Grygla Eagle newspaper printed an article that featured staff member Hitt and the Grygla 4th and 5th graders' participation in the River of Dreams Educational event.
- District staff completed a 2017 Red Lake Watershed District Annual Report. It is available online at:
<http://redlakewatershed.org/Annual%20Reports/2017%20Annual%20Report.pdf>
- District staff used the Red Lake River PTMApp model to help estimate pollutant reductions from a proposed tree planting project near the city of East Grand Forks.
- District staff prepared presentations about current projects for a BWSR tour that was making a stop at the District office.
- Ashley Hitt continued to work on the development of PTMApp for the Thief River watershed.
- The Pennington SWCD shared GIS files with the RLWD that were created for the Thief River Falls stormwater study.
- The RESPEC consulting firm has completed development of the Scenario Application Manager (SAM) graphical interface to the Hydrologic Simulation Program FORTTRAN (HSPF) model application for the Red Lake River, Grand Marais Creek, Clearwater River, Thief River, and Red Lakes watersheds among other watersheds throughout the state. The application and data downloads are available at: <https://www.respec.com/sam-file-sharing/>.
- The East Polk SWCD held a rain barrel workshop at the McIntosh Community Center on May 18, 2018.
- District staff met with United States Fish and Wildlife Service (USFWS) staff to tour wetlands that have been restored by the USFWS in the headwaters of the Lost River and Hill River in Clearwater County.

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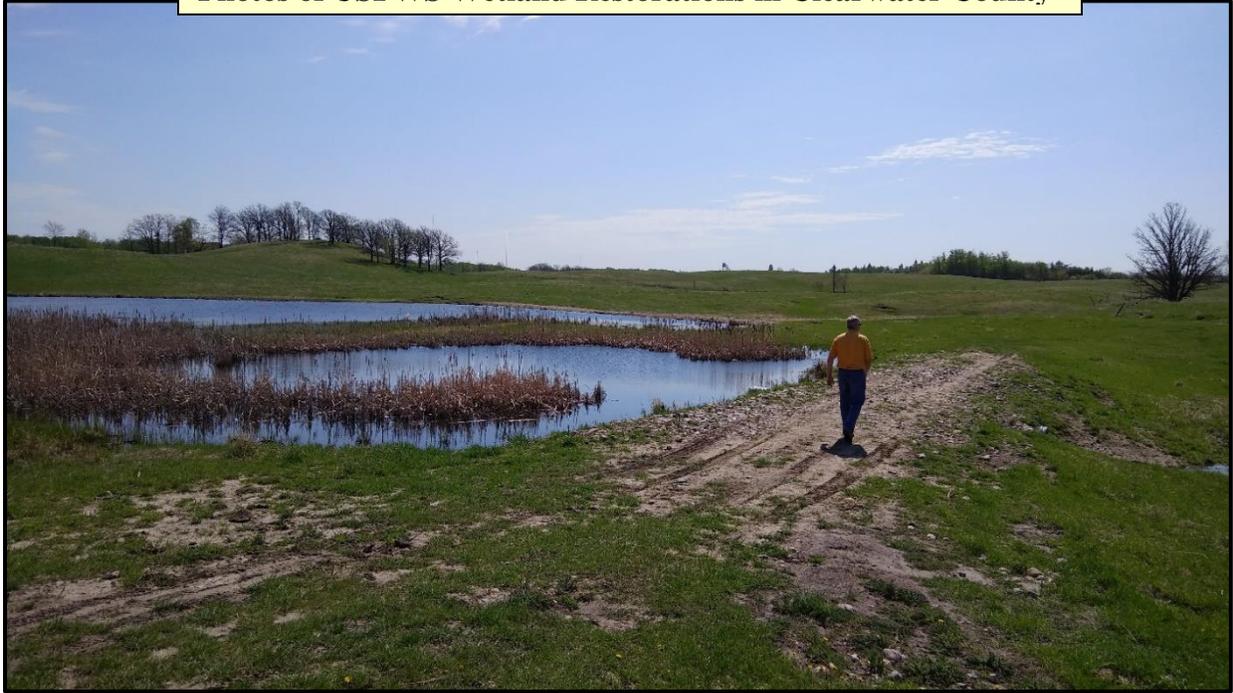
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Photos of USFWS Wetland Restorations in Clearwater County



Photos of USFWS Wetland Restorations in Clearwater County



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- Mann-Kendall statistical trend analysis was conducted on monitoring data from Marshall County Ditch 20.

Trends of Seasonal Averages Using Seasonal Mann-Kendall Analysis				
Marshall County Ditch 20 180th Ave NE Crossing Site S004-494	Total Suspended Solids	Dissolved Oxygen	Total Phosphorus	E. coli
Years	2007-2017	2007-2017	2007-2017	2007-2017
Annual Average	X	X	X	X
Annual Max/Min	X (Max)	+ (Min)	X (Max)	X
May-Sept Average	X	↑	X	X
April	Data <10	Data <10	Data <10	Data <10
May	Data <10	Data <10	Data <10	Data <10
June	↓	↑	X	↑
July	Data <10	↑	Data <10	Data <10
August	Data <10	Data <10	Data <10	Data <10
September	Data <10	Data <10	Data <10	Data <10
October	Data <10	Data <10	Data <10	Data <10
November - March	Data <10	Data <10	Data <10	Data <10
X = No Trend				
+ = Strong Upward Trend (Getting Better)				
↑ = Upward Trend (Getting Better)				
↓ = Downward Trend (Improvement)				
↑ = Upward Trend (Getting Worse)				

- Strong winds and farming practices (rolling a dry field in high winds) led to an extreme amount of wind erosion and sedimentation within a ditch east of Crookston.



May 2018 Meetings and Events

- May 1, 2018 – Red Lake River One Watershed One Plan and PTMApp meeting at the Pennington County Soil and Water Conservation District
 - The Pennington SWCD successfully applied for a NACD Grant to hire a technician that will conduct survey and design work for the installation of best management practices (side water inlets)
 - An engineering technician was also hired to help SWCDs with survey and design work
 - Methods for tracking progress and projects were discussed (ArcOnline, Google documents, what information should be tracked)
 - The Red Lake River 1W1P other waters map and agenda items for the policy committee were discussed.
 - An implementation schedule was reviewed and discussed.
 - The group addressed a series of decisions that needed to be made so that Houston Engineering could proceed with the Red Lake River PTMApp implementation scenarios. An across-the-board sediment reduction goal of 10% was chosen. The edge-of-field option was recommended for the spatial scale of load reduction goals. Efficiency frontier curves will help determine the number of practices and the scale of investment that will be necessary to reach water quality goals.
- May 9, 2018 – Thief River One Watershed One Plan meeting in Grygla (advisory committee, planning work group, and policy committee)
- May 22, 2018 – Meeting with BWSR Clean Water Specialists at the RLWD office.

Red Lake Watershed District Monthly Water Quality Reports are available online:
<http://www.redlakewatershed.org/monthwq.html>.

Learn more about the Red Lake Watershed District at www.redlakewatershed.org.

Learn more about the watershed in which you live (Red Lake River, Thief River, Clearwater River, Grand Marais Creek, or Upper/Lower Red Lakes) at www.rlwdwatersheds.org.

“Like” the Red Lake Watershed District on [Facebook](https://www.facebook.com/redlakewatershed) to stay up-to-date on RLWD reports and activities.