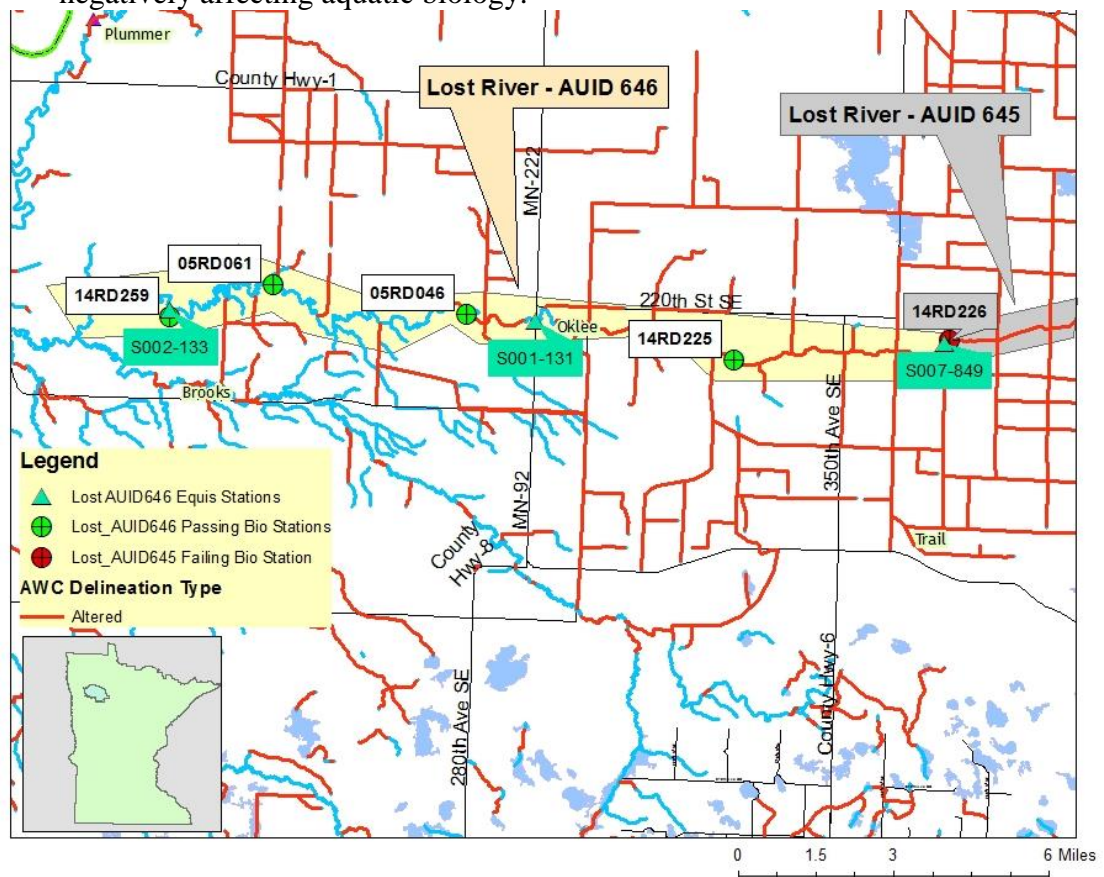


By Corey Hanson, Red Lake Watershed District Water Quality Coordinator. 5/8/2017.

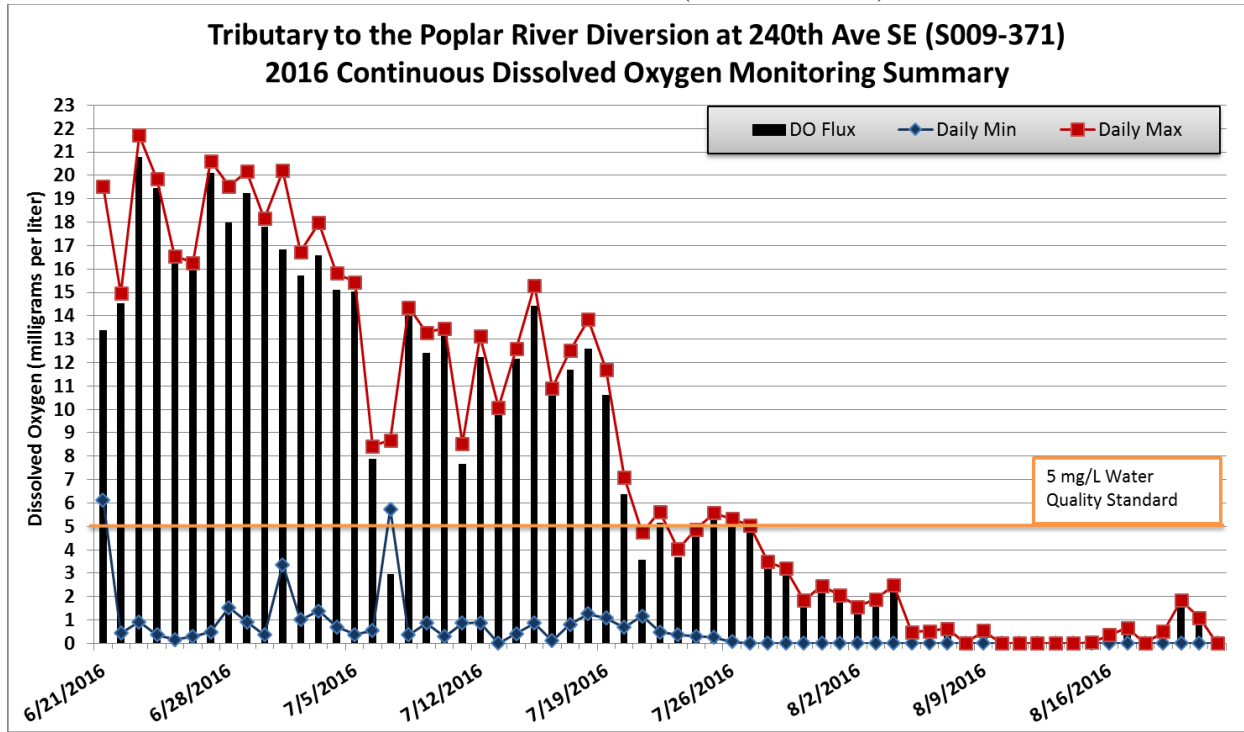
- ✓ Clearwater River Watershed Restoration and Protection Project

**Clearwater River Watershed Restoration and Protection Strategy (WRAPS) Project**

- Objective 6 – Stressor and Pollutant Source Identification
  - A review of the Lost River (channelized reach downstream of Anderson Lake – 09020305-645) section of the Clearwater River Watershed Stressor Identification document was completed.
  - The results of 2016 longitudinal sampling efforts were summarized. Results were included in monthly reports from the summer of 2016.
  - A section of the Clearwater River Stressor Identification report for the 09020305-646 reach of the Lost River was reviewed. The reach is not impaired, but the MPCA included it due to some temporal and spatial changes in the fish and macroinvertebrate communities that may be of concern. The upper portion of this reach is channelized. The reach is not impaired by high total suspended solids or low dissolved oxygen levels, but the standards for those parameters have been violated frequently enough for this reach to be considered a priority for protection consideration. Sedimentation and dissolved oxygen fluctuation may also be negatively affecting aquatic biology.



- Dissolved oxygen data collected in the tributary of the Poplar River Diversion that flows from the outlet of Gerdin Lake (09020305-561) was summarized.



- Continuous dissolved oxygen data from 2016 was submitted to the MPCA for storage in the state’s HYDSTRA database.
- Objective 7 – Data Entry
  - Some longitudinal data that was collected along the Poplar River in 2006 and 2007 had not yet been submitted to the MPCA for storage in the EQuIS database. The sites were not established at the time. All of the crossings of the Poplar River are now established monitoring sites. The 2006-07 data from the newly established sites was submitted to the MPCA for storage in the EQuIS database.
- Objective 10 – Reports
  - A checklist was created for all the sections, subsections, and other features that will be created for the Clearwater River Watershed Total Maximum Daily Load (TMDL) report.
  - A checklist was created for all the sections, subsections, and other features that will be created for the Clearwater River Watershed Restoration and Protection Strategy (WRAPS) document.
  - Some time was spent on writing the Clearwater River TMDL (applicable water quality standards).
  - Some time was spent on writing the Clearwater River WRAPS

**- Trend analysis for Silver Creek**

When Silver Creek, at the 159<sup>th</sup> Ave crossing west of Clearbrook (S000-712) was first sampled for the Clearwater River Dissolved Oxygen (DO) and Fecal Coliform TMDL Study, the E. coli concentrations there were some of the highest that had been found through the RLWD

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monitoring program. The site is located downstream of a livestock operation. A project was implemented to reduce runoff from pens near the farm’s building site, cattle still have access to the stream and are often seen wading in the stream. There also are E. coli sources within the Clear Brook drainage area and further upstream portions of Silver Creek that also contribute to high E. coli concentrations at the S000-712 sampling site. Although E. coli concentrations in Silver Creek in July and September of 2016 were the two lowest concentrations that have been recorded at the site, no trends were found among the annual record of 12-month and summer average or maximum concentrations. Analysis of individual measurement data (not summarized by month or season) also failed to identify any trends. As of the 2016 sampling season, there is insufficient data (<10 years) to conduct Mann-Kendall trend analysis for any calendar months.

- **Trend analysis for Ruffy Brook**

The trend analysis for sites near the pour point of Ruffy Brook yielded mixed results. Although average dissolved oxygen levels have increased, concentrations of pollutants have increased. There is a possibility that recent changes in monitoring strategy have contributed to the increases. The frequency of sampling has increased during the Clearwater River WRAPS and SWAG projects. The long-term monitoring site location was moved from S002-120, one mile downstream to S008-057. Record high concentrations of pollutants (for these sites) were found in 2016 (24,916 MPN/100ml *E. coli*, 0.493 mg/L total phosphorus, and 397 mg/L total suspended solids). At least one more year of E. coli sampling is needed to compile the minimum of 10 years of data for any individual calendar month that is needed to conduct Mann-Kendall trend analysis. Average annual E. coli concentrations did not reveal a trend. However, analysis of annual maximum E. coli concentrations does show an increasing trend.

Trends of Seasonal Averages Using Seasonal Mann-Kendall Analysis				
Ruffy Brook S007-848, S008-057, S002-120	Total Suspended Solids	Dissolved Oxygen	Total Phosphorus	E. coli
Years	1992-2016	1984-2016	1988-2016	1992-2016
Annual (All Months)	X	X	↑+	X
Summer (May - Sept.)	↑	↑	↑	X
April	↓	↑	X	Data <10
May	X	↑+	X	Data <10
June	↑	X	X	Data <10
July	X	X	↑	Data <10
August	X	X	↑	Data <10
September	Data <10	Data <10	X	Data <10
October	X	X	X	Data <10
X = No Trend				
↑+ = Strong Upward Trend (Getting Significantly Worse)				
↑ = Strong Upward Trend (Getting Significantly Better)				
↑ = Upward Trend (Getting Worse)				
↑↓ = Upward Trend (Getting Better)				
↓ = Downward Trend (Improvement)				

- **Trend analysis for the Clearwater River in Red Lake Falls**

The trends at the pour point of the Clearwater River watershed do not present good news. Average annual TSS concentrations are increasing. Dissolved oxygen (DO) fluctuation appears to be increasing. Annual maximum DO concentrations are increasing and annual minimums are decreasing.

<b>Trends of Seasonal Averages Using Seasonal Mann-Kendall Analysis</b>				
<b>Clearwater River in Red Lake Falls (S002-118)</b>	<b>Total Suspended Solids</b>	<b>Dissolved Oxygen</b>	<b>Total Phosphorus</b>	<b>E. coli</b>
Years	1990-2016	1990-2016	1995-2016	1992-2016
Annual Avg (All Months)			X	X
Annual Max (All Months)				
Annual Min (All Months)				
Summer (May - Sept.)			X	X
April	X	X	X	Data <10
May	X		X	X
June	X		X	X
July	X		X	X
August	X			X
September	X			X
October		X		Data <10
X = No Trend				
= Strong Upward Trend (Getting Significantly Worse)				
= Upward Trend (Getting Worse)				
= Downward Trend (Getting Worse)				
= Strong Upward Trend (Getting Significantly Better)				
= Upward Trend (Getting Better)				
= Downward Trend (Improvement)				

- **Trend analysis for the Clearwater River at CSAH 12 near Terrebonne**

Upstream of Red Lake Falls, at the CSAH 12 crossing near Terrebonne S002-914), water quality within the Clearwater River appears to be improving significantly. The Red Lake SWCD collected much of the early data for its monitoring program and the RLWD has added the site to its long-term monitoring program in recent years. It is an important monitoring site because it is the only crossing on the “Lost River to Beau Gerlot Creek” (09020305-511) segment of the river. No trends were identified in annual average or maximum E. coli concentrations. At least one additional year of sampling is needed to obtain the minimum amount of data points needed to conduct seasonal Mann-Kendall trend analysis for E. coli at this site. High nitrates and nitrites (NO<sub>2</sub>+NO<sub>3</sub>) concentrations have been found at this site. Therefore, trend analysis results for

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NO2+NO3 sampling are shown in the following table instead of E. coli trend analysis results. There may be interest in nitrate concentrations in rivers of the Clearwater River watershed due to increased tile drainage in the Clearwater River and its tributaries. The trend analysis revealed that NO2+NO3 concentrations have been increasing in the Clearwater River at CSAH 12.

Trends of Seasonal Averages Using Seasonal Mann-Kendall Analysis				
Clearwater River near Terrebonne (S002-914)	Total Suspended Solids	Dissolved Oxygen	Total Phosphorus	Nitrates + Nitrites
Years	1992-2016	1992-2016	1992-2016	1998-2016
Annual Avg (All Months)			X	
Annual Max (All Months)		X		X
Annual Min (All Months)				
Summer (May - Sept.)			X	
April	Data <10	Data <10	Data <10	Data <10
May		X		
June	X	X	X	
July				X
August				X
September				X
October	Data <10	Data <10	Data <10	Data <10
X = No Trend				
= Strong Upward Trend (Getting Significantly Worse)				
= Upward Trend (Getting Worse)				
= Strong Downward Trend (Getting Significantly Better)				
= Downward Trend (Improvement)				

- **Trend analysis for the Clearwater River at the Plummer USGS Gauge**

There is a very robust history of sampling in the Clearwater River USGS gaging site, north of Plummer (S002-124). Late summer and fall total suspended solids (TSS) concentrations have been decreasing. October samples have been collected in 17 years. The average October TSS concentration was lower than the reporting limit in 8 of those 17 years. Dissolved oxygen and total phosphorus concentrations have been improving. Because data shows improving water quality conditions in the Clearwater River at Terrebonne and Plummer, causes of water quality degradation in the Clearwater River should focus on the portion that flows between CSAH 12 and the Red Lake River. The tributaries that enter the Clearwater River along that reach (Terrebonne Creek, Beau Gerlot Creek, and Lower Badger Creek) should also be examined.

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Trends of Seasonal Averages Using Seasonal Mann-Kendall Analysis				
Clearwater River near Plummer (S002-124)	Total Suspended Solids	Dissolved Oxygen	Total Phosphorus	E. coli
Years	1992-2016	1991-2016	1991-2016	1992-2016
Annual Avg (All Months)	X	↑+	X	X
Annual Max (All Months)	X	↑+	X	X
Annual Min (All Months)		X		
Summer (May - Sept.)	X	↑+	X	X
April	X	↑	X	Data <10
May	X	X	X	X
June	X	↑	X	X
July	↓	↑	↓	X
August	↓	↑+	↓+	X
September	↓	↑+	↓	Data <10
October	↓	↑	↓	Data <10
X = No Trend				
↑+ = Strong Upward Trend (Getting Significantly Better)				
↓+ = Strong Downward Trend (Getting Significantly Better)				
↑ = Upward Trend (Getting Better)				
↓ = Downward Trend (Improvement)				

## Red Lake River Watershed Restoration and Protection Strategy

Comments were received from the DNR on the draft Red Lake River Watershed Total Maximum Daily Load and Red Lake River Watershed Restoration and Protection Strategy reports.

## Grand Marais Creek Watershed Restoration and Protection Project

The [www.prairiebasin.com](http://www.prairiebasin.com) website that was created for this WRAPS project will eventually be merged with the [www.rlwdwatersheds.org](http://www.rlwdwatersheds.org) website.

## Other Notes

- 2016 monitoring data was reviewed so that exceedances of water quality standards could be noted in 2016 monthly and annual water quality reports. Exceedances of the *E. coli* bacteria impairment threshold were noted at many sites in 2016.
- Monthly water quality reports for May, June, July, August, September, October, November, and December 2016 were completed.
  - May 2016: <http://www.redlakewatershed.org/waterquality/MonthlyWQReport/2016%20May%20Water%20Quality%20Report.pdf>

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- June 2016:  
<http://www.redlakewatershed.org/waterquality/MonthlyWQReport/2016%206%20June%20Water%20Quality%20Report.pdf>
- July 2016:  
<http://www.redlakewatershed.org/waterquality/MonthlyWQReport/2016%207%20July%20Water%20Quality%20Report.pdf>
- August 2016:  
<http://www.redlakewatershed.org/waterquality/MonthlyWQReport/2016%208%20August%20Water%20Quality%20Report.pdf>
- September 2016:  
<http://www.redlakewatershed.org/waterquality/MonthlyWQReport/2016%209%20September%20Water%20Quality%20Report.pdf>
- October 2016:  
<http://www.redlakewatershed.org/waterquality/MonthlyWQReport/2016%2010%20October%20Water%20Quality%20Report.pdf>
- November 2016:  
<http://www.redlakewatershed.org/waterquality/MonthlyWQReport/2016%2011%20November%20Water%20Quality%20Report.pdf>
- December 2016:  
<http://www.redlakewatershed.org/waterquality/MonthlyWQReport/2016%2012%20December%20Water%20Quality%20Report.pdf>
- Monthly water quality reports for January and February 2017 were completed and posted on the RLWD website.
  - January 2017:  
<http://www.redlakewatershed.org/waterquality/MonthlyWQReport/2017%201%20January%20Water%20Quality%20Report.pdf>
  - February 2017:  
<http://www.redlakewatershed.org/waterquality/MonthlyWQReport/2017%202%20February%20Water%20Quality%20Report.pdf>
- Thief River One Watershed One Plan project partners worked on developing a request for proposals to begin the process of hiring a contractor for the writing of the plan.
- MPCA staff may be conducting an intensive dissolved oxygen study that could include sites on the Red Lake River in Red Lake Falls and Cyr Creek.
- The Water Quality Coordinator provided some comments for the Koochiching County Water Plan
- SWAT, HSPF, and LiDAR GIS layers were provided to a graduate student that is examining possible strategies for restoring the Mud River within Agassiz National Wildlife Refuge.
- Water quality articles were written for the 2016 RLWD Annual Report.
- RLWD staff prepared presentations for the 2017 Overall Advisory Committee meeting.
- East of the town of Gentilly along the west side of CSAH 11, a large amount of dried beet pulp/tailing had blown into a ditch that drains to Kripple Creek (discovered on 3/21/17). The West Polk SWCD was contacted and the farming operation cleaned some of the material out of the ditch (but not all of it). The photo from 3/26/2017 shows how

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some of the material was scraped out of the ditch, but much remained.

3/21/2017



3/26/2017



- Water quality data collected by the East Polk SWCD in 2016 was submitted to the MPCA for storage in the EQUIS database. A data review was also successfully completed so that the data could be “finalized” for inclusion in the database.



- The MPCA posted a rebuttal response to public comments in the matter of proposed revisions of Minnesota Rules, chapters 7050 and 7052, relating to Tiered Aquatic Life Uses (TALU) and modification of Class 2 beneficial use designations. The MPCA agreed with comments in some instances and made some minor changes to the new water quality standards to address those comments and add clarity. The standards will more clearly state that the biological standards only apply to lotic (flowing) streams and protection of downstream water quality will be considered during assessment of streams and ditches. It was disappointing to see a very disrespectful tone in many of the MPCA’s rebuttal responses. In this and other MPCA “rebuttal response” documents, there are cases in which the MPCA does not attempt to understand the point that a commenter is trying to make. Instead, the response to some comments reveals a desire to prove the commenter wrong. The MPCA actually begins a response to a comment from the Rice Creek Watershed District with the words: “the commenter is incorrect.” The document also reveals that the MPCA still does not understand that there is a difference between “artificial watercourses” and “altered natural waterways,” even though definitions are clearly stated in Minnesota statutes. ” Artificial watercourse means a watercourse artificially constructed by human beings where a natural watercourse was not previously located.” “Altered natural watercourse’ means a former natural watercourse that has been affected by artificial changes to straighten, deepen, narrow, or widen the original channel.” Expectations and restoration goals should logically be different for those two types of watercourses. The MPCA conflates the two definitions by referring to any straight, man-made, or man-altered channel as an “altered watercourse,” without regard to the history or purpose of the channel.
  - Definitions within Minnesota State Statutes: <https://www.revisor.mn.gov/statutes/?id=103G.005>
  - MPCA Rebuttal Response: <https://www.pca.state.mn.us/sites/default/files/wq-rule4-12zz.pdf>
  - An entire MPCA project that is based on a conflation of altered natural waterways and artificial watercourses: <https://www.pca.state.mn.us/water/minnesota-statewide-altered-watercourse-project>

### **March 2017 Meetings and Events**

- **March 1, 2017** – Polk County Water Resources Advisory Committee
  - The West Polk SWCD received grants to do an inventory of the Burnham Creek subwatershed and to stabilize the outlet of a tributary to Burnham Creek (Project 134).
  - The West Polk SWCD is interested in doing more monitoring.
  - “Homework” for the next (6/7/17) meeting involves a review of the plan to identify additions, subtractions, and new (soon-to-be-draft) Clearwater River impairments.
  - The next Polk County WRAC meeting is scheduled for June 7, 2017.
- **March 3, 2017** – Thief River One Watershed One Plan meeting
- **March 7, 2017** – HSPF Scenario Application Manager (HSPF-SAM) training session

- HSPF-SAM was utilized for the Yellow Medicine 1W1P
- The tool can be used to create strategies tables that quantify the BMPs that are needed in order to achieve pollutant reduction goals.
- SAM is not a model. It is an interface for the extraction of information from an existing HSPF model. It is most effective when used in tandem with local scale GIS targeting (PTMApp or ACPF) and local resource manager knowledge.
- BMP suitability can be estimated on the HUC-12 scale.
- Before HSPF-SAM can be used for a watershed, someone familiar with the HSPF model must complete a Processing Application Translator for HSPF (PATH) process for the watershed.
- **March 9, 2017** – RLWD Board of Managers meeting. Water quality related items from the agenda and minutes:
- **March 13, 2017** – Pennington County Water Resources Advisory Committee meeting
  - Five drainage areas within Pennington County have been identified as “other waters” that could benefit from riparian protection. Buffers will be recommended, but not enforced along those reaches.
  - The septic system inventory of the Chief’s Coulee watershed found 3 violations. New systems should be installed sometime this year (before next winter).
  - The fieldwork for the county’s ditch inventory is done and SWCD staff will be prioritizing ditches based on the need for buffers and side water inlets. Ditch inventory information was used to apply for a clean water fund grant.
  - Identification of streambank stabilization opportunities will also be a part of the Thief River Falls Stormwater Assessment. PTMApp is being developed for the Thief River Watershed. Houston Engineering, Inc. will run a buffer alternative analysis on all Thief River Parcels.
  - The SWCD received a grant to use drones to inspect 53 ditch outlets in the county.
  - Updates were given on the Red Lake River and Thief River One watershed One Plan processes.
  - The SWCD has ordered 12,000 trees that will be planted this year.
  - There is a potential streambank stabilization project in St. Hilaire.
  - The county is looking into renting billboard space to display messages about aquatic invasive species (AIS).
  - The water control structure on Agassiz Pool is currently closed.
  - The USFWS has applied for a Lessard-Sams grant for cattail management and replacement of some internal water control structures.
  - The USFWS is hiring a temporary employee to conduct bathymetric work.
  - The next Pennington County WRAC meeting is scheduled for June 5, 2017.
- **March 20, 2017** – RLWD Overall Advisory Committee meeting.
- **March 23, 2017** – RLWD Board of Managers meeting. Water quality related items from the agenda and minutes:

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**Quote of the Month:**

“The wisest mind has something yet to learn.”  
George Santayana

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](http://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](http://www.rlwdwatersheds.org).

“Like” the Red Lake Watershed District on [Facebook](#) to stay up-to-date on RLWD reports and activities. .