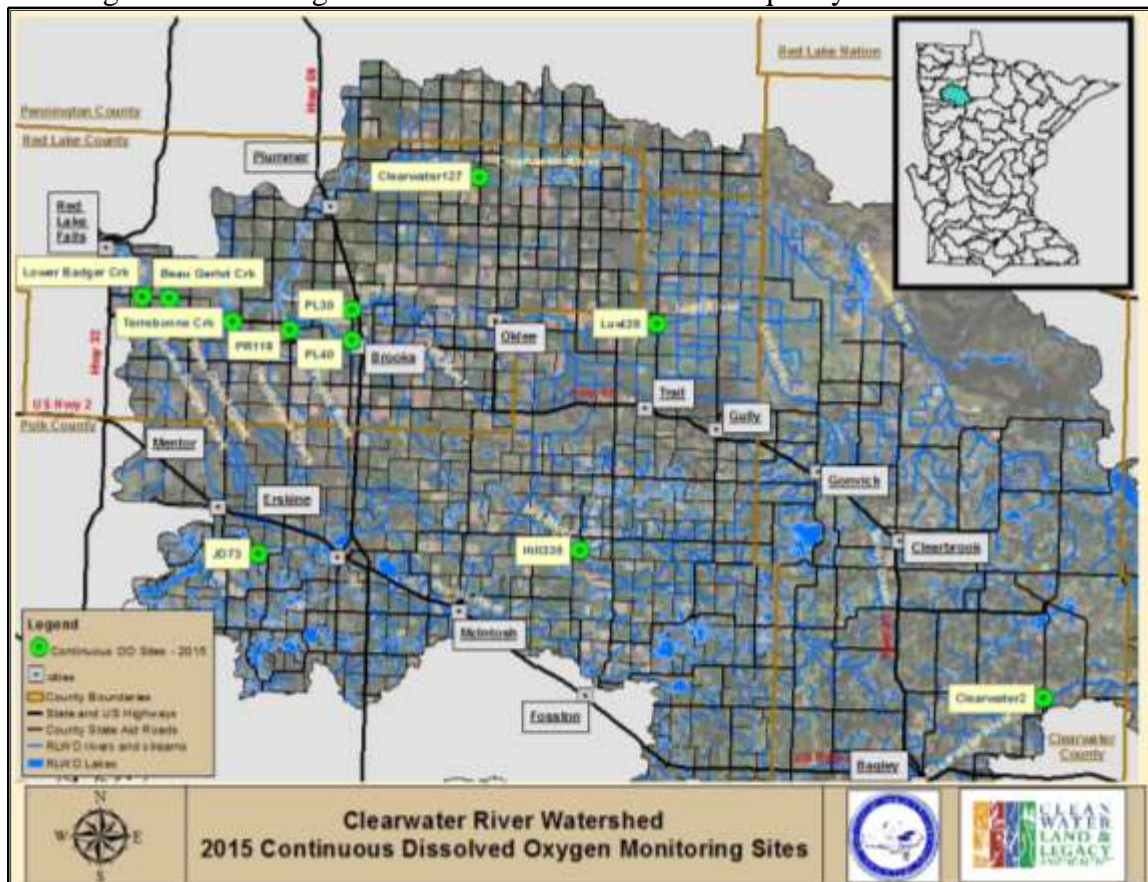


By Corey Hanson, Red Lake Watershed District Water Quality Coordinator. January 6, 2016.

- ✓ Watershed Restoration and Protection project updates
- ✓ 2015 continuous dissolved oxygen records from monitoring sites in the Clearwater River watershed.

Clearwater River Watershed Restoration and Protection (WRAP) Project

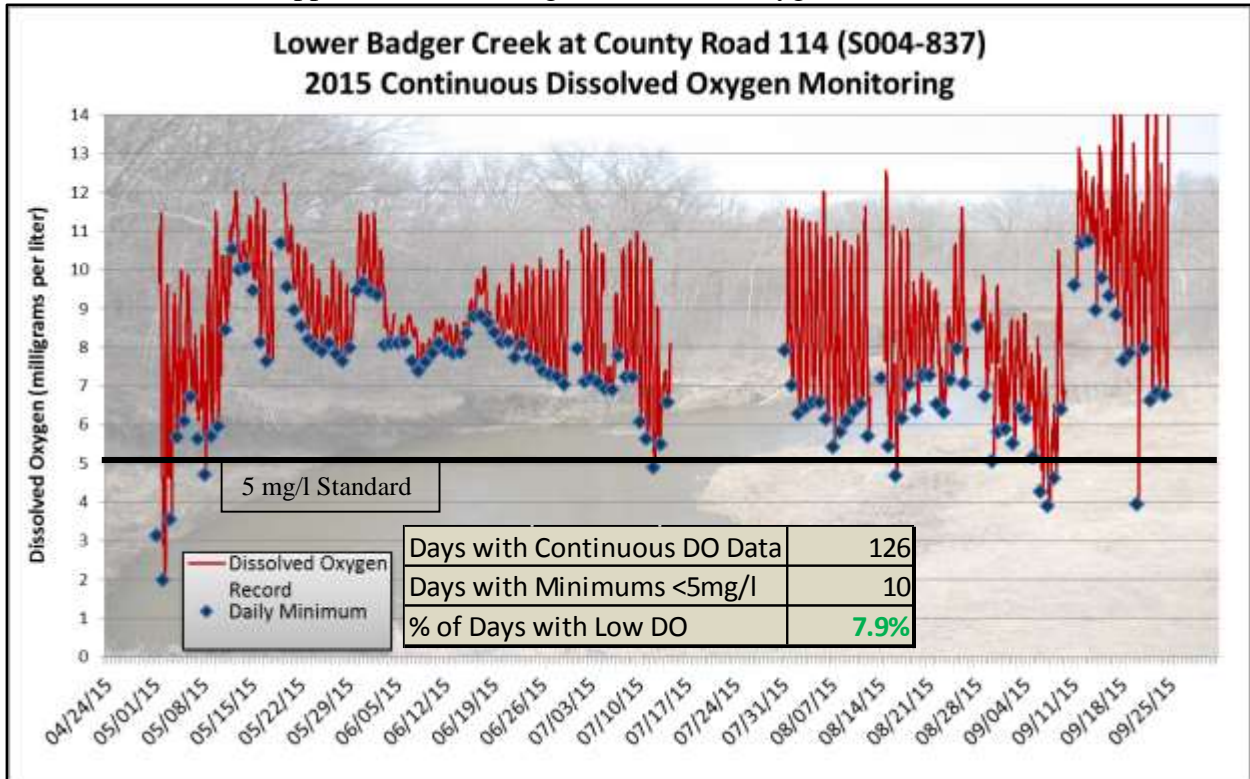
- Objective 3 – Flow Monitoring
 - HOBO water level loggers were retrieved for the winter.
 - Data was downloaded from HOBO water level loggers.
- Objective 7 – Data Entry
 - A data review was completed on the 2015 Clearwater River WRAP monitoring data so it could be finalized in the EQUIS water quality database.
 - In November, continuous dissolved oxygen monitoring data was compiled, corrected, summarized, graphed, and submitted to the MPCA for use in the upcoming water quality assessment. In December, RLWD staff also provided MPCA staff with the full raw and corrected 2015 continuous dissolved oxygen data sets from the Clearwater River watershed.
 - More than 90% of the daily minimum dissolved oxygen readings need to be greater than 5 mg/l in order to meet the state water quality standard.



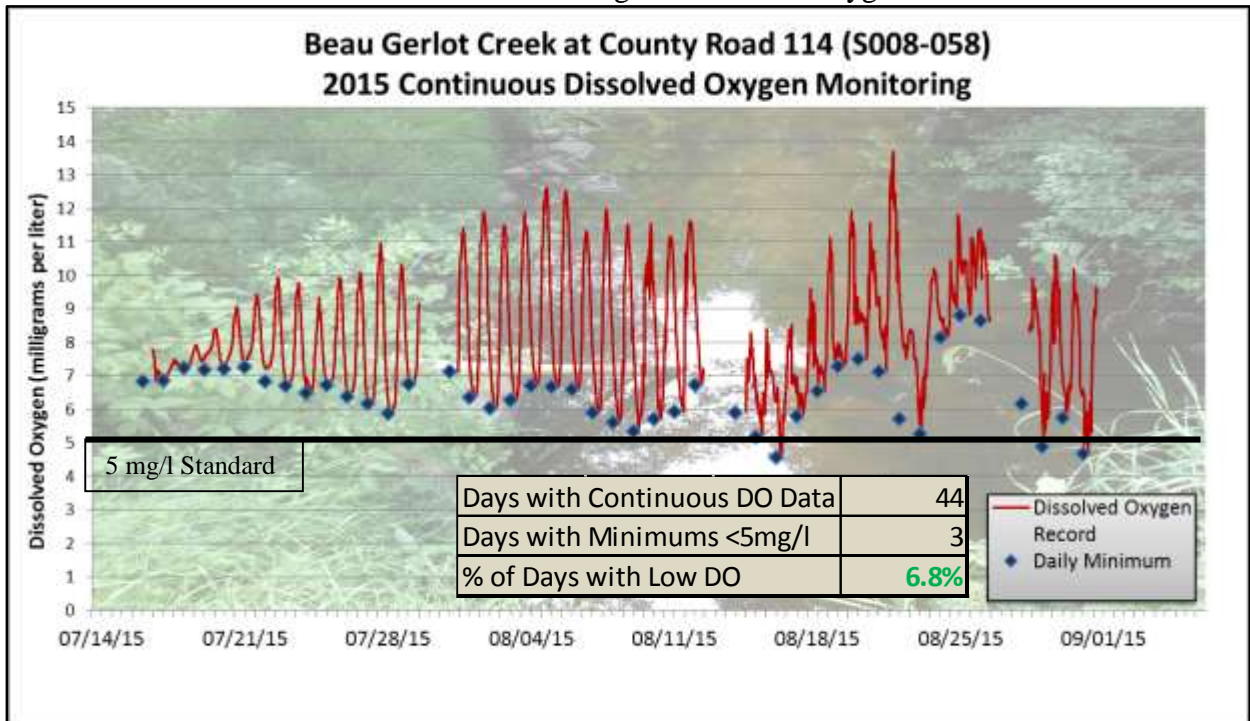
RED LAKE WATERSHED DISTRICT MONTHLY WATER QUALITY REPORT

**November-
December 2015**

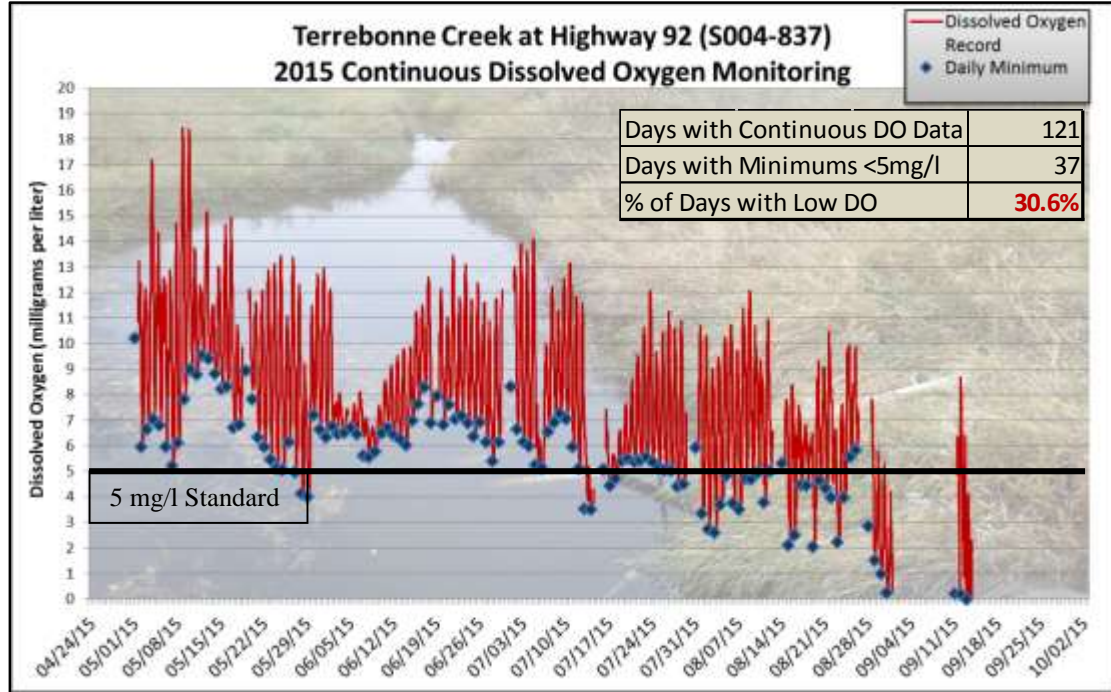
- Lower Badger Creek at Red Lake County Road 114 (S004-837). Lower Badger Creek appears to be meeting the dissolved oxygen standard at this site.



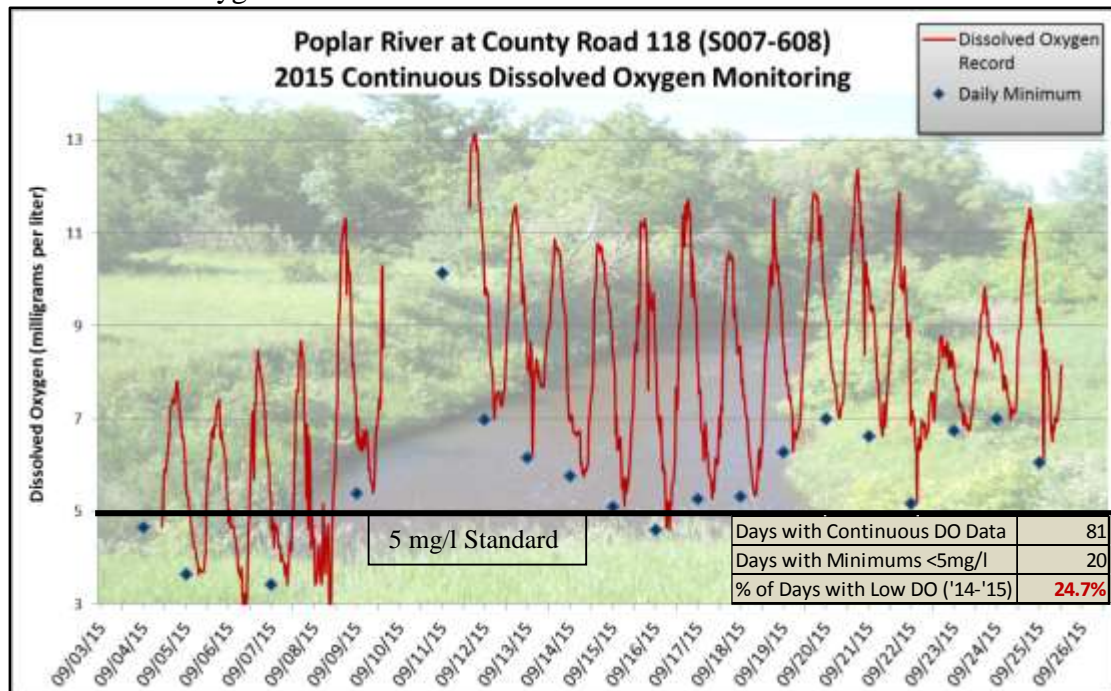
- Beau Gerlot Creek at Red Lake County Road 114 (BGC114, S008-058). Beau Gerlot Creek seems to be meeting the dissolved oxygen standard at this site.



- Terrebonne Creek at State Highway 92 (S004-837). Terrebonne Creek is not meeting the dissolved oxygen standard at this site. Stagnant water in the late summer is one of the probably causes of the low dissolved oxygen levels.



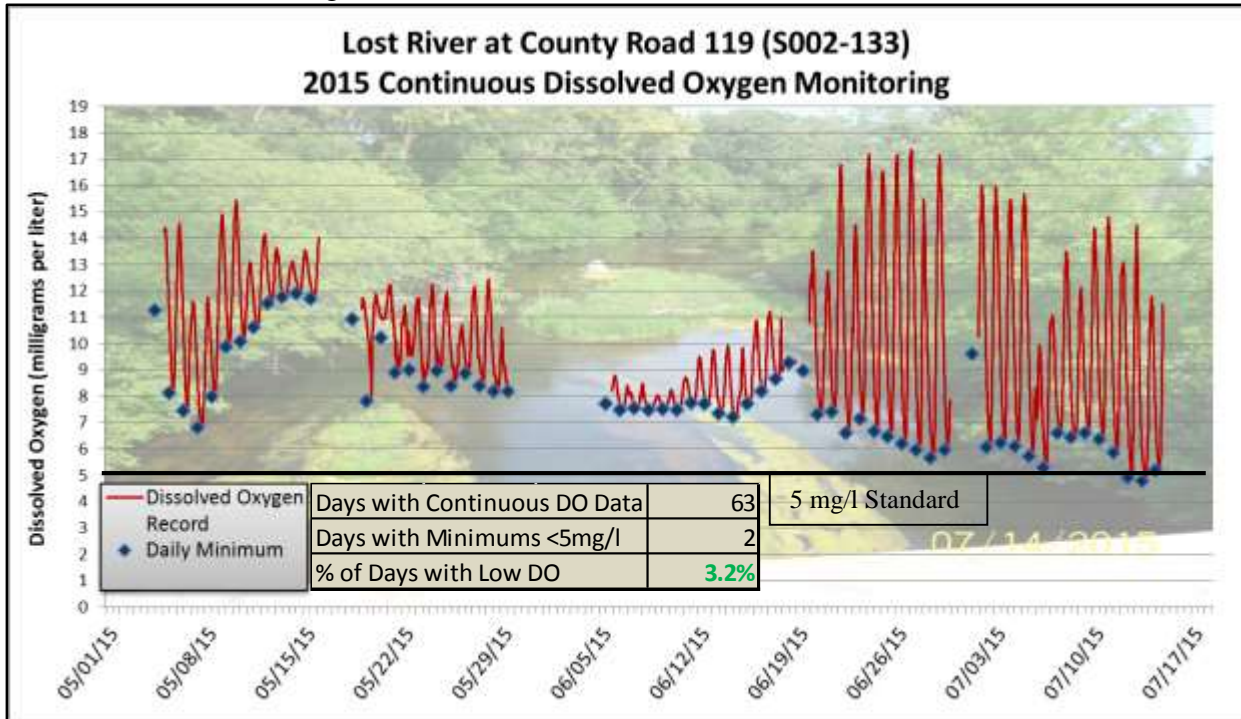
- Poplar River at Red Lake County Road 118 (PR118, S007-608). The Poplar River was continuously monitored in 2014 and 2015. The results of the 2015 monitoring supported the results of the 2014 monitoring. The Poplar River is not meeting the dissolved oxygen standard at this site.



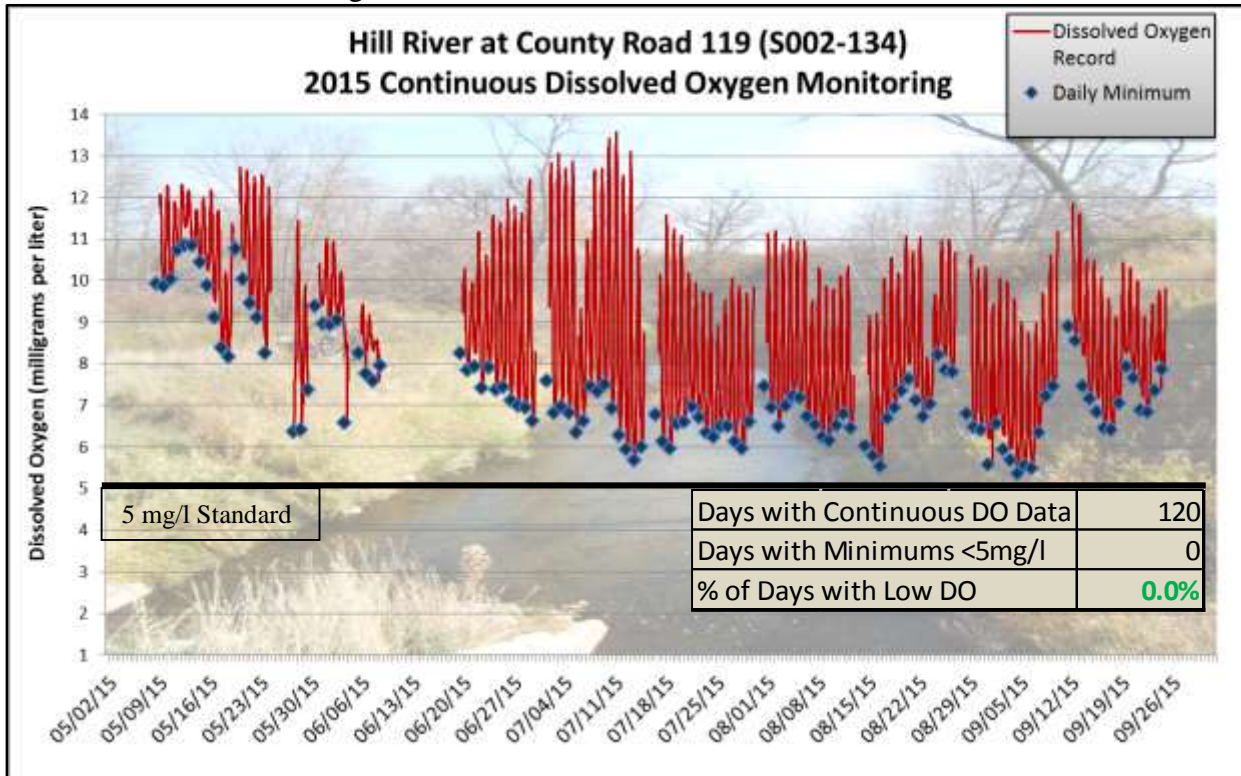
RED LAKE WATERSHED DISTRICT MONTHLY WATER QUALITY REPORT

**November-
December 2015**

- Lost River at Red Lake County Road 119 (PL30, S002-133). Dissolved oxygen levels are good at this site.



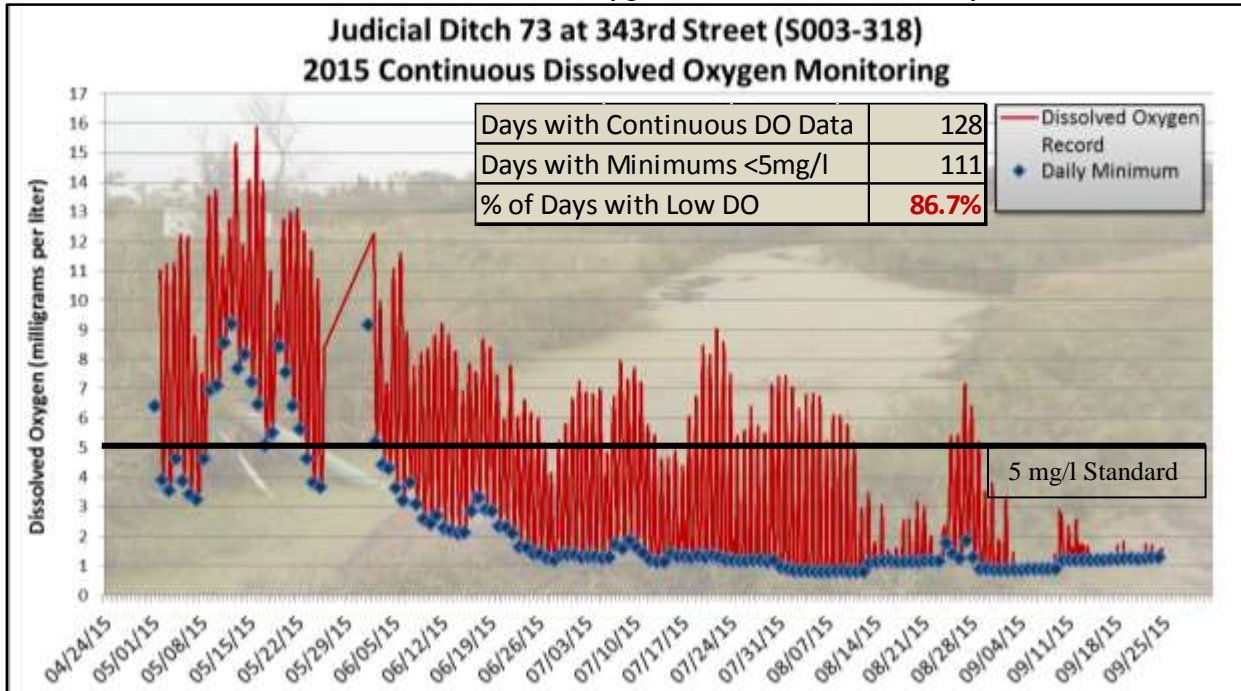
- Hill River at Red Lake County Road 119 (PL40, S002-134). Dissolved oxygen levels were great at this site.



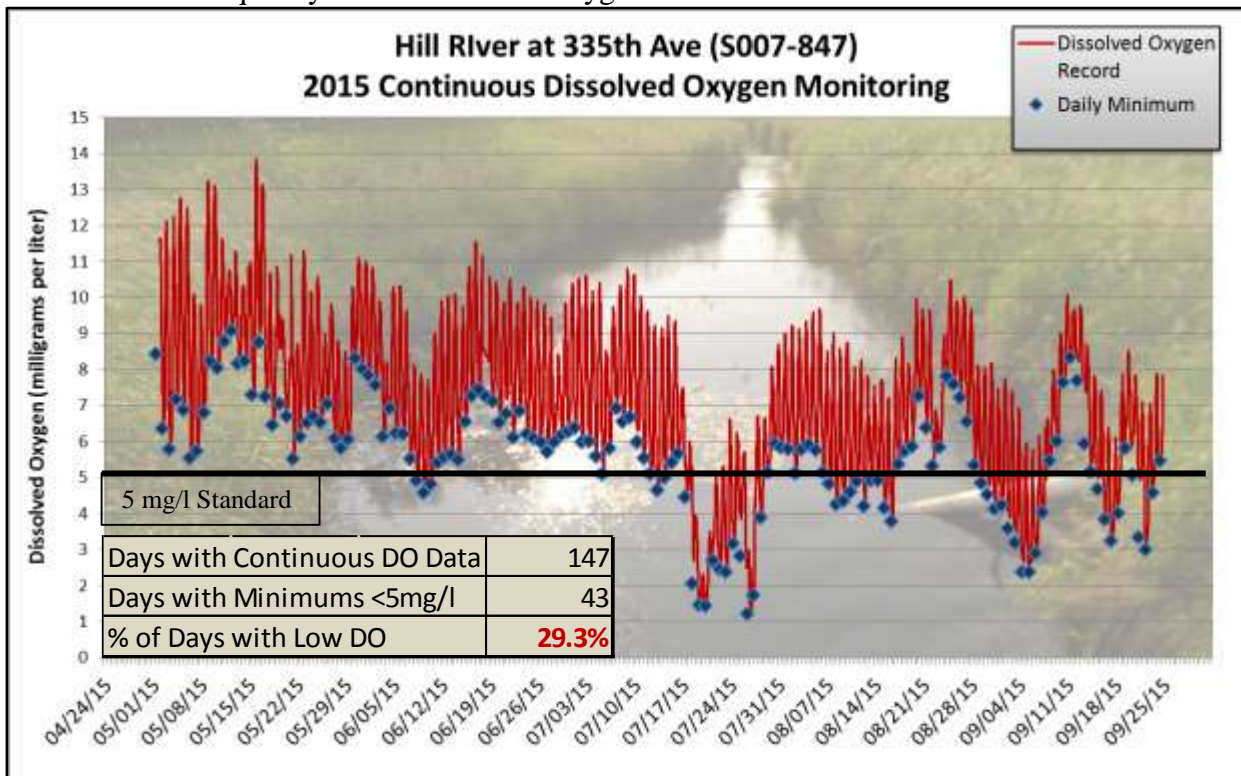
RED LAKE WATERSHED DISTRICT MONTHLY WATER QUALITY REPORT

**November-
December 2015**

- Judicial Ditch 73 at 343rd Street SE, upstream of Rydell National Wildlife Refuge (JD73, S003-318). Dissolved oxygen levels were consistently low at this site.



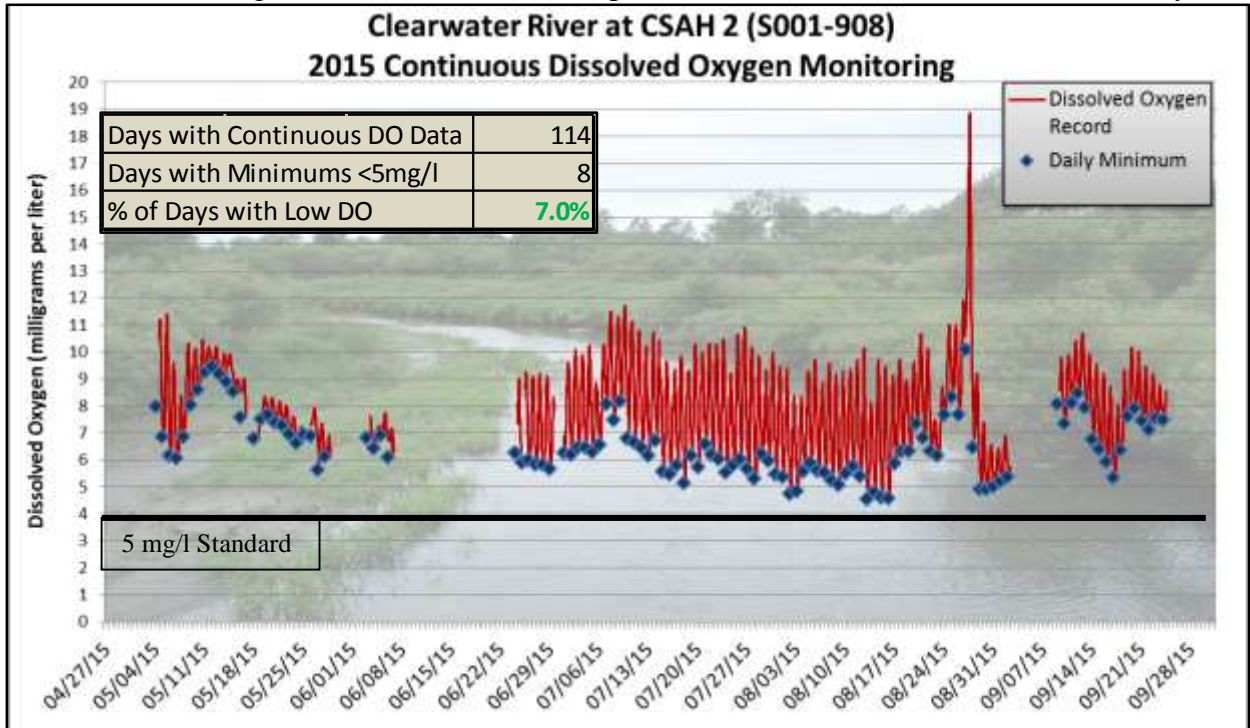
- Hill River at 335th Ave (Hill335, S007-847). Stagnant water led to an increased frequency of low dissolved oxygen levels in the late summer.



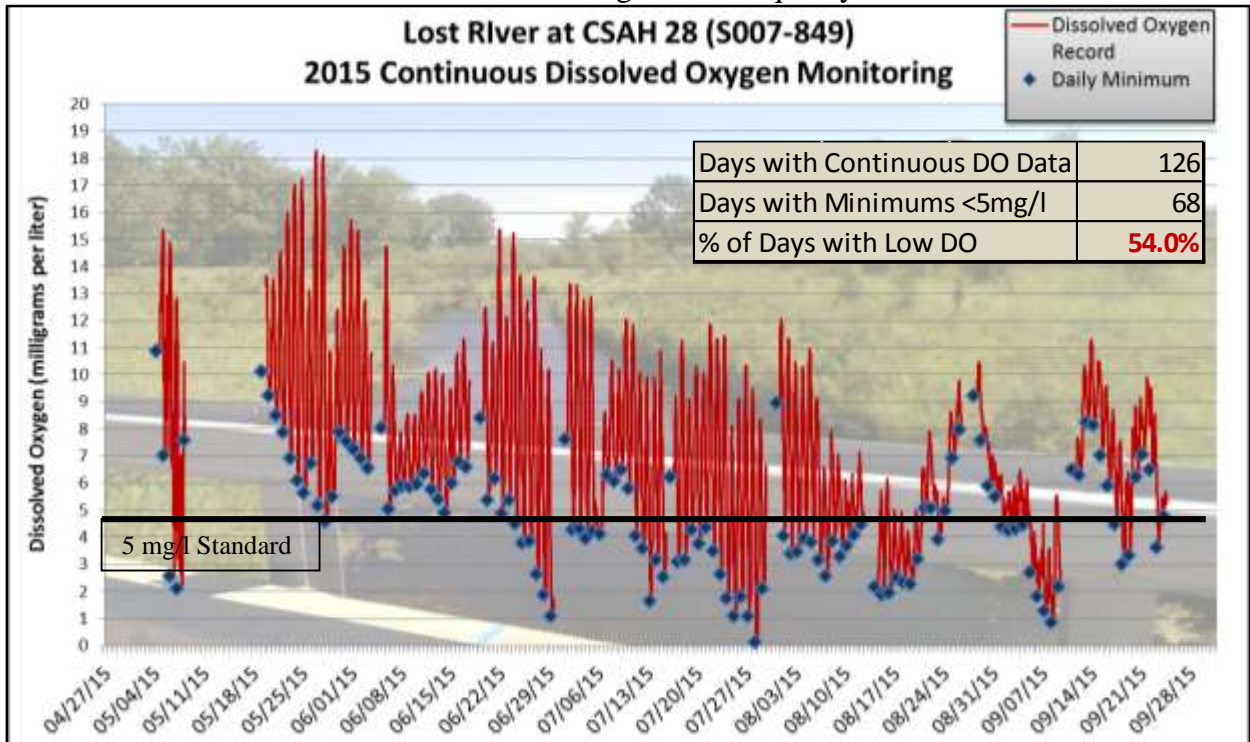
RED LAKE WATERSHED DISTRICT MONTHLY WATER QUALITY REPORT

November-
December 2015

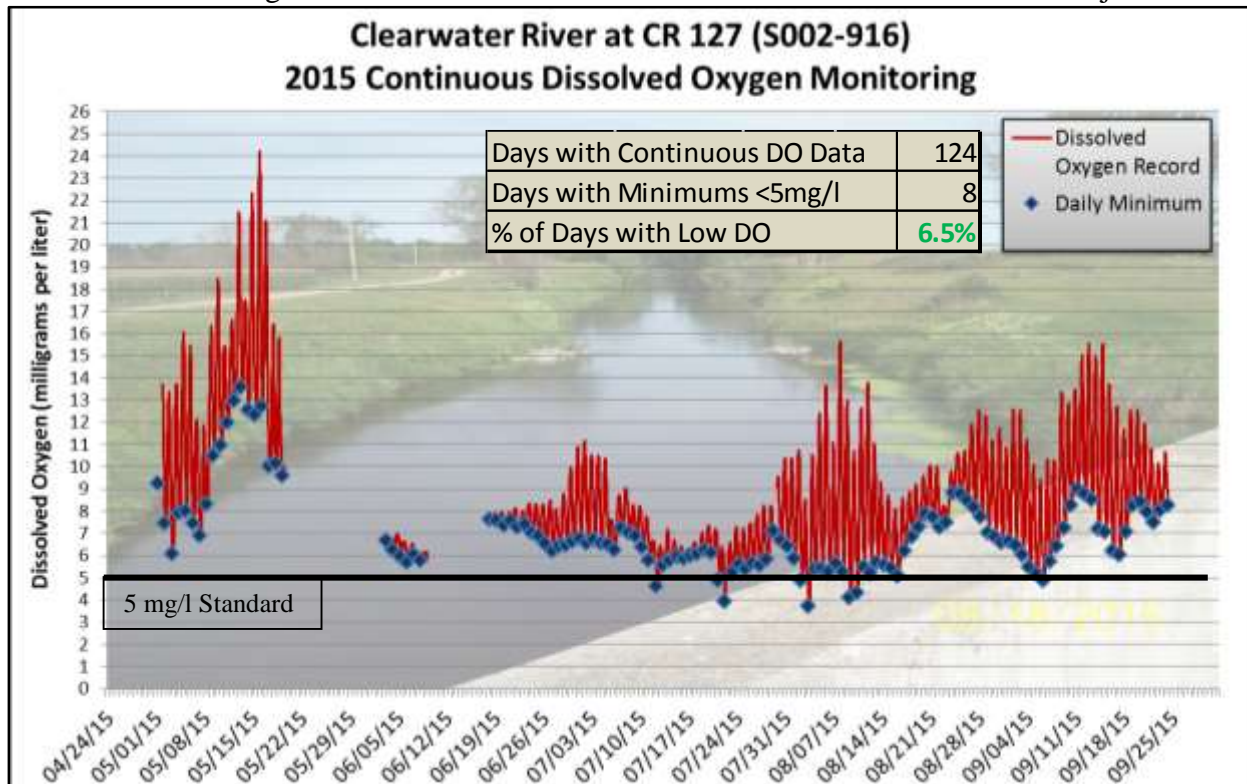
- Clearwater River at County State Aid Highway 2 (Clearwater2, S001-908). Even though it is located within an impaired reach, DO levels at this site were okay.



- Lost River at Polk County Road 28 (Lost28, S007-849). The pooling of water behind a rock structure and beaver activity may have negatively affected DO levels at this site. It is not meeting the water quality standard.



- Clearwater River at Red Lake County Road 127 (Clearwater127, S002-916). Despite some periodic low dissolved oxygen readings, The Clearwater River seems to be meeting the water quality standard at this site. This is important because this site lies on a reach of the Clearwater River that is listed as impaired by low dissolved oxygen. Monitoring during a previous TMDL study indicated that the reach may be meeting the dissolved oxygen water quality standard, but the MPCA wanted more continuous data from the reach in order to prove that it is meeting the standard. This set of data could serve as that additional proof, along with a number of extra pre-9am discrete measurements that have been made during the Clearwater River Watershed Restoration and Protection Project. .



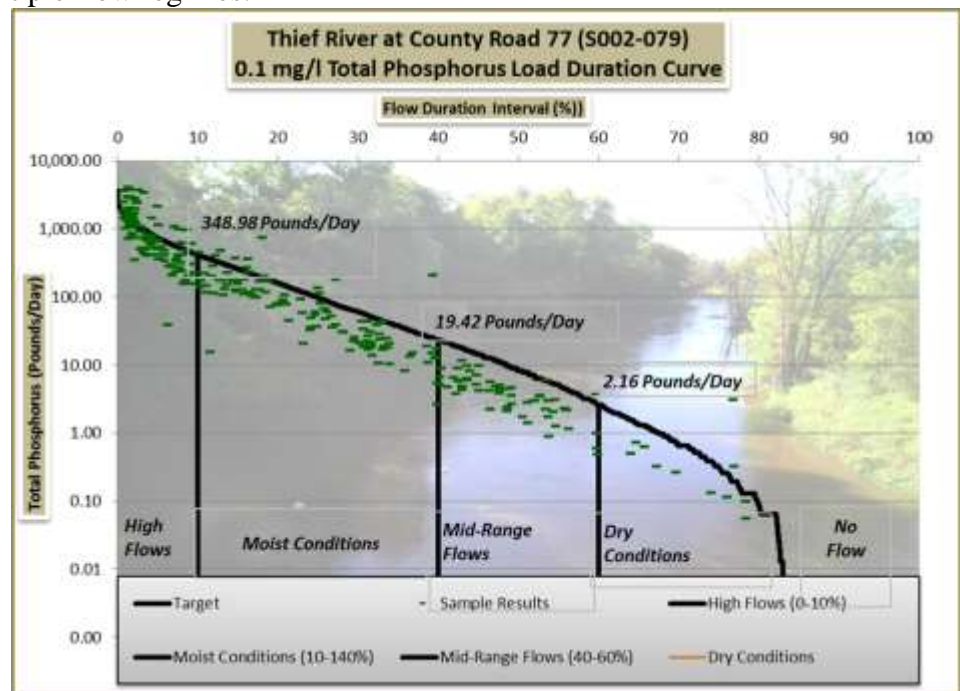
- Task 8 – Data Analysis
 - Clearwater River water quality assessment results were reviewed to find waterbodies that are candidates for removal from the 303(d) List of Impaired Waters because they are currently meeting water quality standards or because the impairments are caused by natural conditions.

Clearwater River Watershed Surface Water Assessment Grant (SWAG) Project

- A data review was completed on the 2015 Clearwater River SWAG monitoring data so it could be finalized in the EQuIS water quality database.
- A final report for the project was completed and sent to the MPCA Project Manager. The final report compares the number of samples collected to the number of samples that were planned and also provides an analysis of blank and field replicate sample results.

Thief River Watershed Restoration and Protection (WRAP) Project

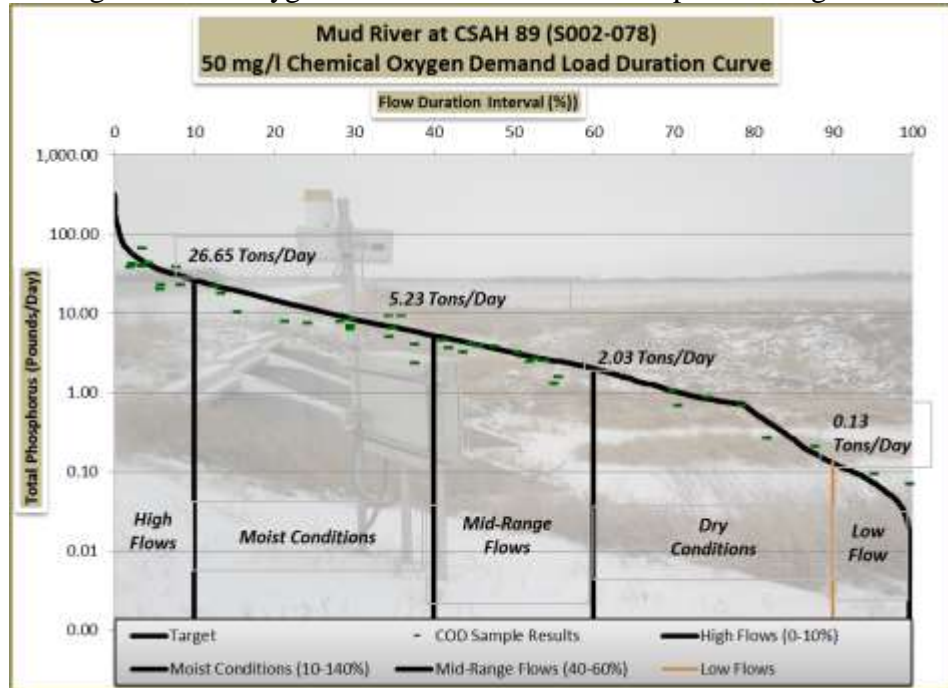
- Task 5 – Flow Monitoring
 - HOBO water level loggers were retrieved for the winter.
 - Data was downloaded from HOBO water level loggers.
- Task 9 – Data Entry
 - Thief River WRAP monitoring data was reviewed and submitted to the MPCA for entry into the EQuIS water quality database on the data submittal deadline of 11/2/2015.
- Task 10 – Data Analysis
 - Delisting paperwork was prepared to begin the process of recommending that the E. coli impairments on the Mud River and Branch A of JD21 be removed from the 303(d) List of Impaired Waters.
 - Load allocations were calculated to address the Thief River dissolved oxygen impairment by establishing total phosphorus total maximum daily loads (TMDL) for multiple flow regimes.



RED LAKE WATERSHED DISTRICT MONTHLY WATER QUALITY REPORT

**November-
December 2015**

- Load allocations were calculated for the Mud River dissolved oxygen impairment by establishing chemical oxygen demand TMDLs for multiple flow regimes.



- Analysis of Moose River dissolved oxygen (DO) data revealed that most of the Moose River Impoundment to Thief Lake reach of the river meets the dissolved oxygen standard as long as there is measureable flow at the CSAH 54 stage/flow monitoring site. Daily minimum DO data from the Moose River was cross-referenced with the CSAH 54 flow record. Measurements made at the monitoring site at the Thief Lake inlet (300th Ave NE, S006-539) were filtered out of the analysis, too. That site is essentially an extension of the Thief Lake pool and is not representative of the river. All dissolved oxygen measurements made on days in which the average flow at CSAH 54 was zero were filtered out of the analysis. After those two filters were applied, the applicable measures of the occurrence rate of low dissolved oxygen levels were all less than 10%.

Moose River Flow Based Dissolved Oxygen Assessment										
All sites except S006-539 (Thief Lake Inlet). Continuous data from 2009 and 2012 at site S004-211 (CSASH 54). Flow recorded at site S004-211.										
Dissolved Oxygen Data was filtered for seasons and flow.	All DO Data Points			All DO Data Points with Flow Data			All DO Data Points with > 0 CFS Flow			
	Total #	# < 5 mg/l	Rate (%)	Total #	# < 5 mg/l	Rate (%)	Total #	# < 5 mg/l	Rate (%)	
DO12_All	Discrete Data	132	10	8%	108	7	6%	74	4	5%
	Continuous Data	139	65	47%	109	43	39%	43	2	5%
	Discrete & Continuous	249	73	29%	199	49	25%	106	6	6%
DO5_All	Discrete Data	98	9	9%	79	6	8%	54	4	7%
	Continuous Data	125	65	52%	95	43	45%	37	2	5%
	Discrete & Continuous	203	72	35%	160	48	30%	82	6	7%
DO5_9am	Discrete Data	5	2	Insufficient Data	5	2	Insufficient Data	2	1	Insufficient Data
	Continuous Data	119	64	54%	98	43	44%	31	2	6%
	Discrete & Continuous	123	66	54%	103	45	44%	33	3	9%

DO12 = All discrete dissolved oxygen measurements from all 12 months of January through December (% of daily minimums < 5 mg/l)

DO5 = Dissolved oxygen over the 5 summer months of May through September (% < 5 mg/l)

DO5 9am = Dissolved oxygen measurements collected during the months of May through September prior to 9am plus any low readings observed during those months (daily minimum would definitely fall below 5 mg/l if any measurement during the day is < 5 mg/l). This column may not be complete, time metadata was not readily available for every dissolved oxygen measurement.

- Task 11 – Civic Engagement
 - A link to the 2015 Thief River Watershed Fluvial Geomorphology Report was added to the list of Thief River documents on the RLWDWatersheds.org website.
 - <http://redlakewatershed.org/waterquality/Thief%20R%20Geomorphology%20Report%20Nov2015.pdf>
- Task 13 – Reports
 - Progress continued on the Thief River Watershed Restoration and Protection Strategy (WRAPS) and Total Maximum Daily Load reports.
 - Staff from the Minnesota Board of Water and Soil Resources (Matt Fisher), Minnesota Department of Natural Resources (Stephanie Klamm, Lori Clark, and Jason Vinje), Minnesota Pollution Control Agency (Denise Oakes), and the Pennington Soil and Water Conservation District (Peter Nelson) reviewed the draft Restoration and Protection Strategies section of the Thief River WRAPS report. Their comments were incorporated into the document. The lists of compiled strategies for the watershed as a whole and for each HUC10 subwatershed will be compiled into tables for each geographic area. Stephanie Klamm of the Minnesota DNR volunteered to help with that task.

Red Lake River Watershed Assessment Project (Watershed Restoration and Protection - WRAP)

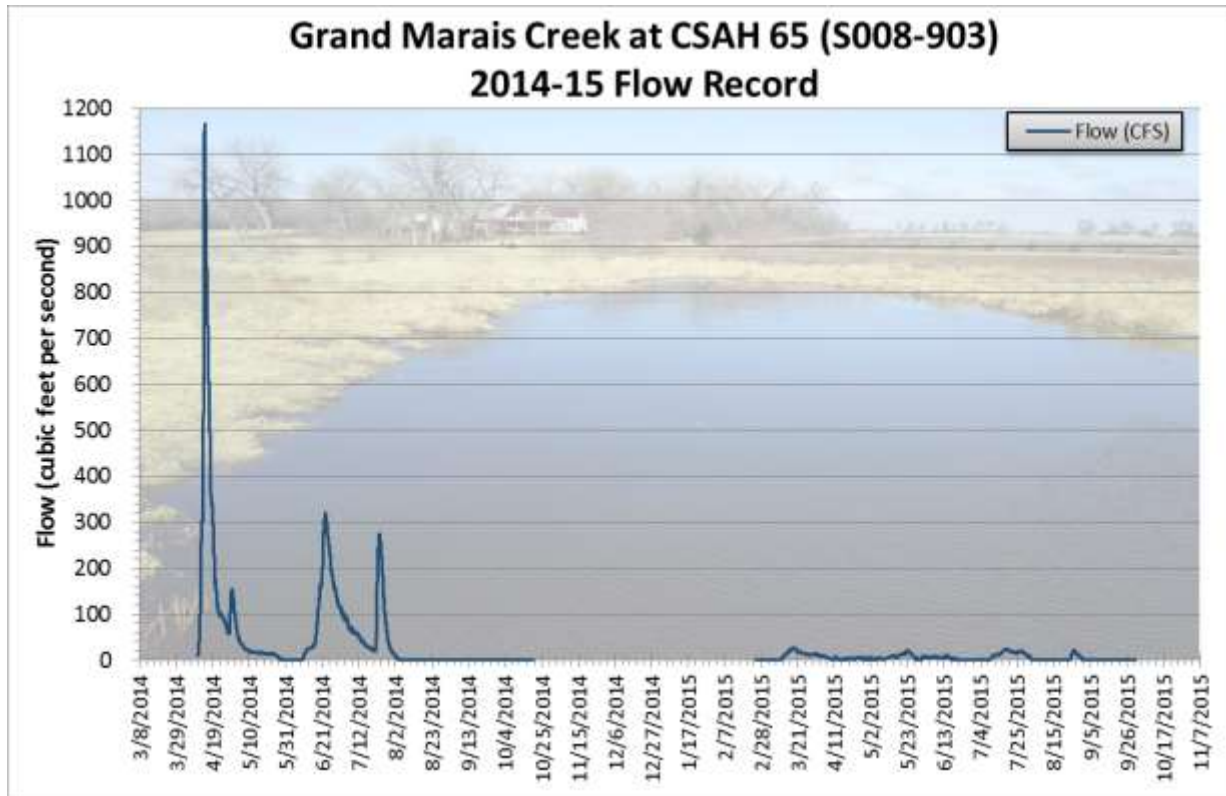
- Task 5 – Flow Monitoring
 - HOBO water level loggers were retrieved for the winter.
 - Flow has remained high in the Red Lake River upstream of Thief River Falls. It has been too high to reach the HOBO deployment pipe to retrieve the water level logger.
 - Data was downloaded from HOBO water level loggers.
- Task 9 – Data Analysis
 - Red Lake River watershed water quality assessment results were reviewed and recommendations were made to MPCA staff for the removal of waterbodies from the 303(d) List of Impaired Waters that were originally listed as impaired by high turbidity but currently meet the new water quality standard for total suspended solids.
- MPCA staff are working on a Watershed Monitoring and Assessment Report for the Red Lake River watershed.

Red Lake Watershed District Long-Term Monitoring Program

District monitoring data entry was completed. Data was reviewed prior to submittal to the Minnesota Pollution Control Agency (MPCA) for entry into the EQUIS database. Data from the Clearwater River monitoring sites will be used in the upcoming official water quality assessment of that watershed. Some site establishment forms needed to be submitted for new sites that were part of a set of longitudinal water quality measurements along the Polk County Ditch 2 drainage system. A final data review was completed on the 2015 monitoring data so it could be finalized in the EQUIS water quality database.

Grand Marais Creek Watershed Restoration and Protection Project

Flow data from the Polk County Road 65 crossing of Grand Marais Creek from the MPCA gauge at the site. The following graph shows how little flow there was in Grand Marais Creek in 2015 compared to the previous year.

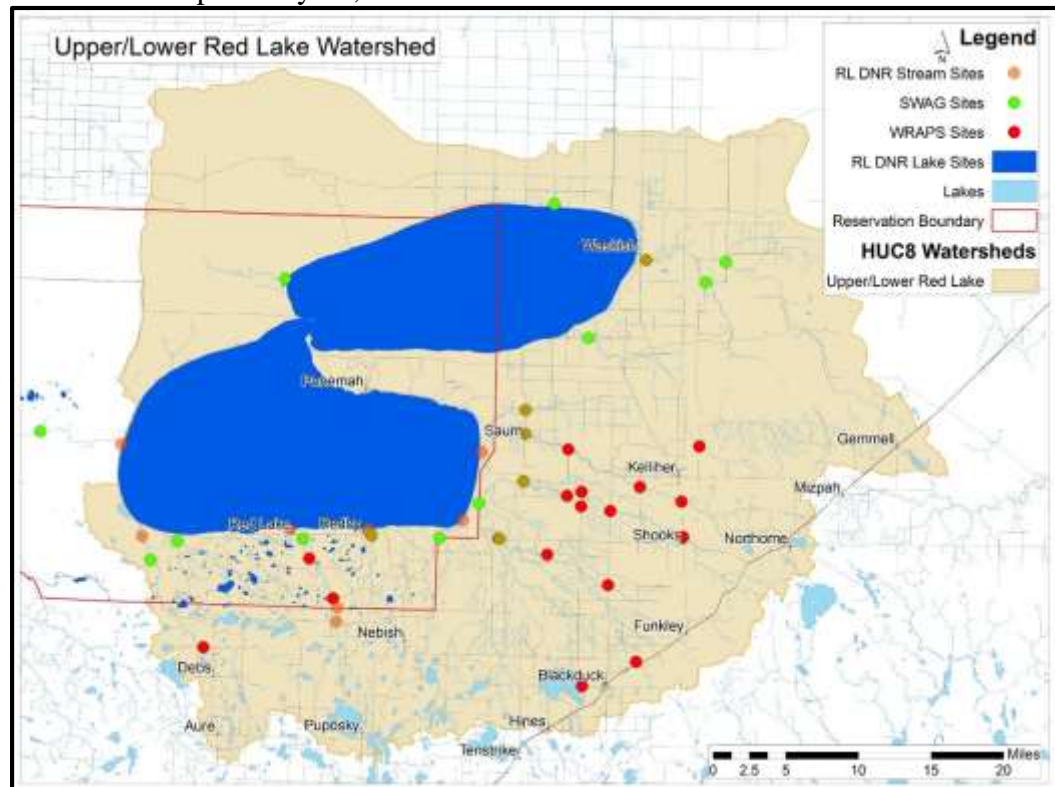


Emmons and Olivier Resources staff worked on summarizing the watershed's water quality impairments, summarizing flow data, and developing load duration curves.

Other Notes

- Water quality related topics from the November 12, 2015 RLWD Board of Managers meeting minutes:
 - Kayla Bowe, Biologist, Red Lake DNR updated the Board on the Upper/Lower Red Lake's Watershed Restoration and Protection Strategy (WRAPS) Project. Bowe stated that project is funded through the Minnesota Clean Water Legacy Act/MPCA. The project consists of monitoring water bodies and collecting data; assessing the data; developing strategies to restore and protect the watershed's water bodies; and conducting restoration and protection projects in the watershed. Red Lake DNR staff currently monitor 19 streams sites, continue stage monitoring, flow measurements, continuous dissolved oxygen monitoring, assist with stream channel stability assessments, assist with stressor ID fieldwork and

plan and participate in stakeholder and TAC meetings. The contract with the MPCA will expire May 21, 2017.



- It was noted in the River Rendezvous, that the International Water Institute (IWI) is raising funds for educational programs, Give to the Max Day, held on November 12, 2015. Donations will help cover the costs of equipment for the River Explorers kayaking program, allowing the IWI to reach more students in the Red River Basin. Motion by Tiedemann, seconded by Ose, to donate \$500 to the International Water Institute, for the Give to the Max Day. Motion carried.
- Water quality related topics from the November 24, 2015 RLWD Board of Managers meeting minutes:
 - The Board reviewed correspondence from the Lessard-Sams Outdoor Heritage Council congratulating the District on the completion of the Grand Marais Channel Restoration Project, RLWD Project No. 60F that was partially funded through the Outdoor Heritage Fund.
- Water quality related topics from the December 10, 2015 RLWD Board of Managers meeting minutes:
 - Brad Johnson, Houston Engineering, Inc. appeared before the Board to present construction plans and opinion of probable cost for repair of the Latundresse Dam, located in Section 19 of Red Lake Falls Township in Red Lake County. Johnson stated that the estimate for this project is coming in over the threshold of where the District would need to advertise for bids versus receiving quotes. Johnson stated that repairs were designed with replacement of the structure, with a 3:1 slope on both sides of the embankment for maintenance purposes and to

provide more stability to the dike at an estimated construction cost of \$145,701. The Latundresse Dam outlets into the Red Lake River, preventing erosion control in an area with significant elevation difference with a small permanent pool. Manager Knott stated that another landowner in the area has approached the Red Lake SWCD in regard to some erosion control sites within the same area. Knott will contact SWCD staff to discuss what potential projects may be in the area. Discussion was held on how the District should move forward with maintenance on the NRCS/SWCD impoundments/structures that were turned over the District after construction. It was the consensus of the Board to have District staff categorize/prioritize the potential sites and report back to the Board.

- Three large log jams were removed from the Clearwater River, approximately 2.75 miles west of Red Lake County Road 127.



- While retrieving HOBO water level loggers, District staff noticed that a home was being built along the unstable banks of Polk County Ditch 1, west of the City of Crookston along Polk County Road 61 (SW corner of Section 23 in Lowell Township). The building also happens to overlook the flowers that mark the spot where Dru Sjodin's body was found. You can judge that decision for yourself. The home is probably not in danger of flooding from the ditch because of the ditch's depth. According to the International Water Institute's LiDAR viewer website, the channel bottom is over 20 feet below the top of the bank. It also met zoning requirements sufficiently to get permitted and it is set back from the bank approximately 100 feet according to county personnel. Erosion and unstable banks could still be a cause for concern. Large bank failures have been a problem along waterways in the Crookston area. The banks of CD1 are steep. The gradient of the ditch channel between Highway 2 and the Red Lake River is also steep. This gradient creates extreme flow velocities during runoff events. Velocities as high as 13 feet per second have been measured in the County Road 61 culvert and water likely moves even faster at higher levels of flow. Fresh slumping of the banks has been observed during recent runoff events since water quality data collection at the site began in 2012. Despite the potentially precarious location of the building, it may be indirectly protected by a future in-channel project. Due to the rate of erosion and instability due to the steep gradient, this reach of CD1 is an area that should be targeted with a grade stabilization project to reduce erosion and reduce sediment contributions to the Red Lake River.



Location relative to Crookston and recent bank failures shown in aerial photos:



- MN DNR Staff found that spoiled grain was being dumped into a ditch north of Agassiz National Wildlife Refuge.



- River Watch Kick-Off events were successfully held in 3 locations throughout the Red River Basin, including the Red Lake Watershed District office and the University of Minnesota, Crookston. Teams participated in a challenging communication activity, researched and assessed their local rivers, and gave a 1 minute pitch to the entire group about opportunities and challenges for recreation on their river. Schools in attendance are well on their way to being prepared for the 2016 Forum. *Credit for photos and text belongs to the International Water Institute.*



November and December 2015 Meetings and Events

- **November 4, 2015** – Marshall County Water Resources Advisory Committee Meeting
- **December 2015** – Thief River Watershed Restoration and Protection Project Open House Meeting
- **December 16, 2015** – Red Lake River One Watershed One Plan Technical Advisory Committee meeting
- **December 18, 2015** – Red River Basin Monitoring Advisory Committee Meeting at the Sand Hill Watershed District Office in Fertile
- **December 31, 2015** – Target date for draft Thief River TMDL and WRAPS reports
- **December 31, 2015** – Deadline for the Clearwater River Surface Water Assessment Grant Project's final report

Upcoming Meetings/Events

- **January 2016** – a Phase II work plan for the Clearwater River Watershed Restoration and Protection Project will be developed.
- **January 4, 2016** – Pennington County Water Resources Committee Meeting.
- **January 19-21, 2016** – 33rd Annual Red River Basin Land and Water International Summit Conference – Alerus Center, Grand Forks
- **January 31, 2016** – Target date for draft Red Lake River TMDL and WRAPS Reports
- **June 30, 2016** – End date for the Red Lake River Watershed Restoration and Protection Project (extended from June 30, 2015)
- **June 30, 2016** – End date for the Thief River Watershed Restoration and Protection Project (Extended from 12/31/15).
- **February or March 2016** – Possible stakeholders’ or open house meeting for the Thief River WRAP Project.
- **March 2016** – Possible stakeholders or open house meeting for the Red Lake River WRAP
- **March 15, 2016** – River Watch Forum

Plans for early 2016

- Thief River Watershed Restoration and Protection Project.
 - Stage and flow data compilation.
 - Creating Stream Power Index maps.
 - Maps of HSPF model results
 - Complete a draft Thief River Watershed TMDL Report
 - Complete a draft WRAPS Report
 - Plan a stakeholders’ or open house meeting to present findings of the project and the recommendations compiled in the reports.
 - Edit TMDL and WRAPS reports based on comments during the review process.
- Red Lake River Watershed Assessment Project
 - Stage and flow data compilation.
 - Creating Stream Power Index maps.
 - Flow characterization
 - Load allocations
 - Complete a draft Red River Watershed TMDL Report
 - Complete a draft Red River WRAPS Report
 - Technical Advisory meeting to review TMDL and WRAPS reports
 - Hold a meeting to discuss restoration and protection strategies for the WRAPS and TMDL reports.
- Clearwater River Watershed Restoration and Protection Project
 - Write a short report on existing data, conditions, and knowledge of the watershed (summarizations of existing reports).
 - Stage and flow data compilation.
 - Participate in the assessment process

- Identify areas that are in need of stressor identification efforts.
- Draft a Phase II work plan for the project
- Grand Marais Creek Watershed Restoration and Protection project
 - Technical advisory committee and public open house meetings.
 - Emmons and Olivier Resources staff will work on writing the TMDL and WRAPS reports.

Quote of the Month:

“If you want to lift yourself up, lift up someone else”

- Booker T. Washington

Red Lake Watershed District Monthly Water Quality Reports are available online at:

<http://www.redlakewatershed.org/monthwq.html>.

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