RED LAKE WATERSHED DISTRICT MONTHLY WATER QUALITY REPORT	May 2015

By Corey Hanson, Red Lake Watershed District Water Quality Coordinator. July 28, 2015.

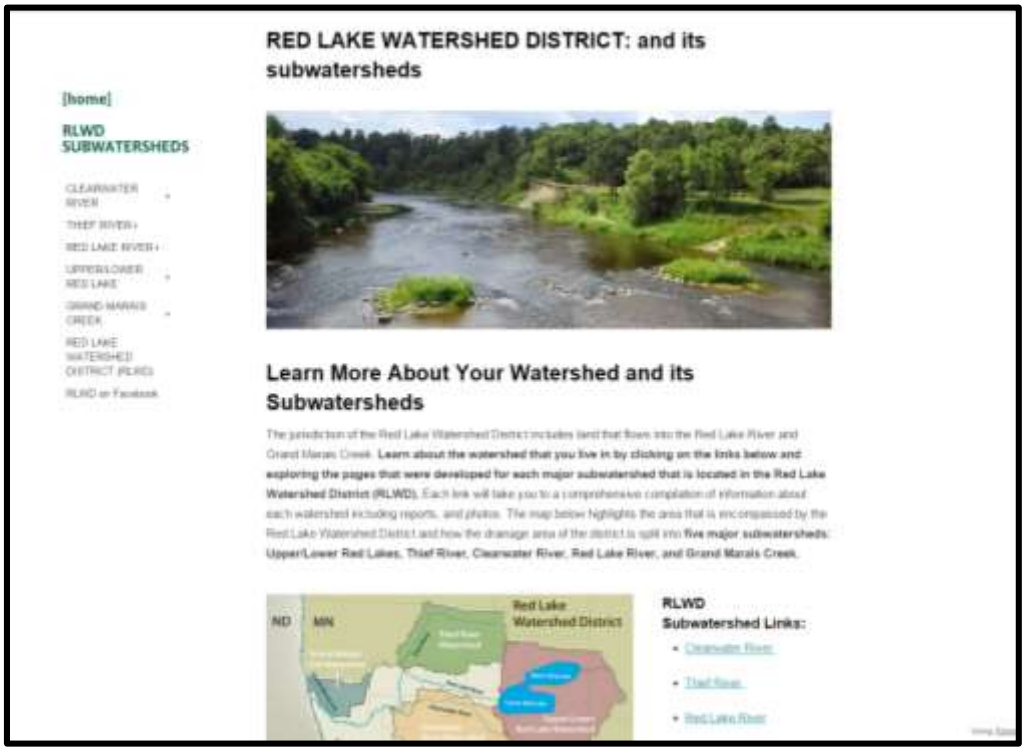
New RLWD Web Pages Provide Watershed-Specific Information for each Major Watershed within the Red Lake Watershed District

The Red Lake Watershed District, with help from Emmons and Olivier Resources, Inc., has launched a new set of web pages to make it easier for anyone to learn more about a watershed. Each of the five major watersheds within the Red Lake Watershed District will have has its own set of pages with general information, links to reports, a photo gallery, Watershed Restoration and Protection project information, maps, and contacts. Organizing information by watershed should make it easier for people to find information that is pertinent to the area in which they live/farm/hunt/fish.

Grand Marais Creek has had its own web pages for a while now. The Thief River, Clearwater River and Red Lake River watersheds were completed using this new format and the Upper/Lower Red Lakes watershed will get its own dedicated web pages during the Upper/Lower Red Lakes Watershed Restoration and Protection project.

These pages were made possible by the civic engagement objectives that are a part of each watershed's Watershed Restoration and Protection projects, which are funded by the Clean WaterLandand Legacy Amendment.

Follow this link to begin exploring your watershed: http://www.rlwdwatersheds.org/



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Clearwater River Watershed Restoration and Protection (WRAP) Project

Objective 4 – Continuous Dissolved Oxygen Monitoring

- Dissolved oxygen loggers were deployed at 9 sites at the beginning of May
  - Lower Badger Creek at CR114
    - Dissolved oxygen levels were okay until the last day of the first deployment. Because of rain events, the low dissolved oxygen readings at the end of the deployment could have been due to debris or sedimentation.
    - Most of the dissolved oxygen readings were okay in the latter half of May. The last reading from the logger almost exactly matched the reading taken with a portable sonde during sonde retrieval. The HOBO dissolved oxygen loggers, like the one deployed at this sites, have worked wonderfully.
  - Terrebonne Creek at Hwy 92
    - Dissolved oxygen levels were all good during the first, early May deployment. All daily minimums were greater than 5 mg/l and most were >6 mg/l.
    - Low dissolved oxygen levels were recorded in approximately one half of the days in the second deployment (latter half of May). Dissolved oxygen levels fluctuated greatly.
  - Judicial Ditch 73 by Rydell National Wildlife Refuge
    - Dissolved oxygen levels dropped below 5, or even 4 mg/l, daily during low flows. Dissolved oxygen levels improved during and after a rainfall event that increased flow.
    - Some days during the latter half of May also had dissolved oxygen levels that dropped below 5 mg/l.
  - Hill River at 335th Ave
    - All dissolved oxygen readings were >5 mg/l during the first half of May.
    - Dissolved oxygen was also great during the latter half of May.
  - Lost River at CSAH 28
    - All days had low dissolved oxygen readings during the first deployment. Dissolved oxygen crashed, so the pipe is likely in a poor spot. It should be repositioned ASAP.
    - After the pipe was repositioned for the second deployment, there was only one day in which dissolved oxygen dropped below 5 mg/l during the latter half of May.

- Clearwater River at CSAH 2
  - Dissolved oxygen stayed above 5 mg/l for most days, except for a couple of short periods in which DO crashed (likely due to sedimentation).
  - Dissolved oxygen levels were okay at this site in the latter half of May before the pipe once again filled with sediment.
- Clearwater River at County Road 127
  - Dissolved oxygen levels looked good during the first half of May. All readings were greater than 5 mg/l during the first deployment.
  - There was a period of time in latter May in which dissolved oxygen levels were very low.
- Hill River at County Road 119, north of Brooks
  - All days met the dissolved oxygen standard during the first, early May deployment. All readings were >8 mg/l, so dissolved oxygen levels were very good.
  - Low dissolved oxygen levels were recorded in late May. Sedimentation and debris may have influenced the readings.
- Lost River at County Road 119, north of Brooks
  - All dissolved oxygen readings were >6 mg/l during the first half of May.
  - 3 days in the second deployment (5/18 – 6/3) had dissolved oxygen levels that dropped below 4 mg/l. Sedimentation during runoff is a likely cause of these low readings.

- Objective 6 – Stressor and Pollutant Source Identification
  - Photos of erosion were taken during monitoring. Some sites were identified where side water inlets should be installed to reduce gully erosion. There are many miles of road ditches within the Clearwater River watershed with almost no vegetative buffer, especially in the western half of the watershed.

Messy well installation, north of Mentor along CSAH 12 near Beau Gerlot Creek

Erosion and lack of a buffer along CSAH 28, north of Trail

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A potential fish passage barrier was found on Lower Badger Creek. It appears to be an old road crossing to an abandoned building site.

- Objective 9 – Civic Engagement
  - Watershed-based web pages were launched. Emmons and Olivier Resources, Inc. staff provided RLWD staff with a tutorial of how to edit the new www.RLWDwatersheds.org web pages.

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

- Task 7 – Stressor Identification
  - Photos of erosion problems and poorly buffered fields/ditches were taken during monitoring.

- Task 10 – Civic Engagement
    - Watershed-based web pages were launched. Emmons and Olivier Resources, Inc. staff provided RLWD staff with a tutorial of how to edit the new www.RLWDwatersheds.org web pages.

Thief River Watershed Restoration and Protection (WRAP) Project

The contract for this project was extended to 12/31/2015.

- Task 10 – Data Analysis
    - Continuous dissolved oxygen data from the Agassiz Pool to Red Lake River reach of the Thief River was reviewed. Data collected through 2009 looked good. The September and October data at the USGS gaging site (S002-079) didn't look like it was representative of stream conditions (compared to discrete data), even though the logger(s) met QA/QC goals in the lab. An improvement in dissolved oxygen levels that brings the reach into compliance with water quality standards may be within reach. Dissolved oxygen needs to be above 5 mg/l on 90% of days (especially during the summer months of May through September). Overall, the reach is within a few percentage points of meeting the standard. The assessment results improve when individual sites are examined. The only site that doesn't appear to meet the standard during the months of May through September is the 140th Ave NE crossing (S002-079) where continuous monitoring results push the rate of low dissolved oxygen readings up to 11.85%. At County Road 7 (near Agassiz National Wildlife Refuge), the rate of low dissolved oxygen readings (including continuous DO) during the months of May through September was just 4.48%. The difference between the two sites is mostly due to 2012 data that was collected at S002-079, but not at S002-088. 2012 was a year of low flow and frequent low dissolved oxygen readings at many sites throughout the Red Lake Watershed District. When 2012 data is excluded from the S002-079 record, the rate of low dissolved oxygen readings drops from 11.85% to 6.85%.

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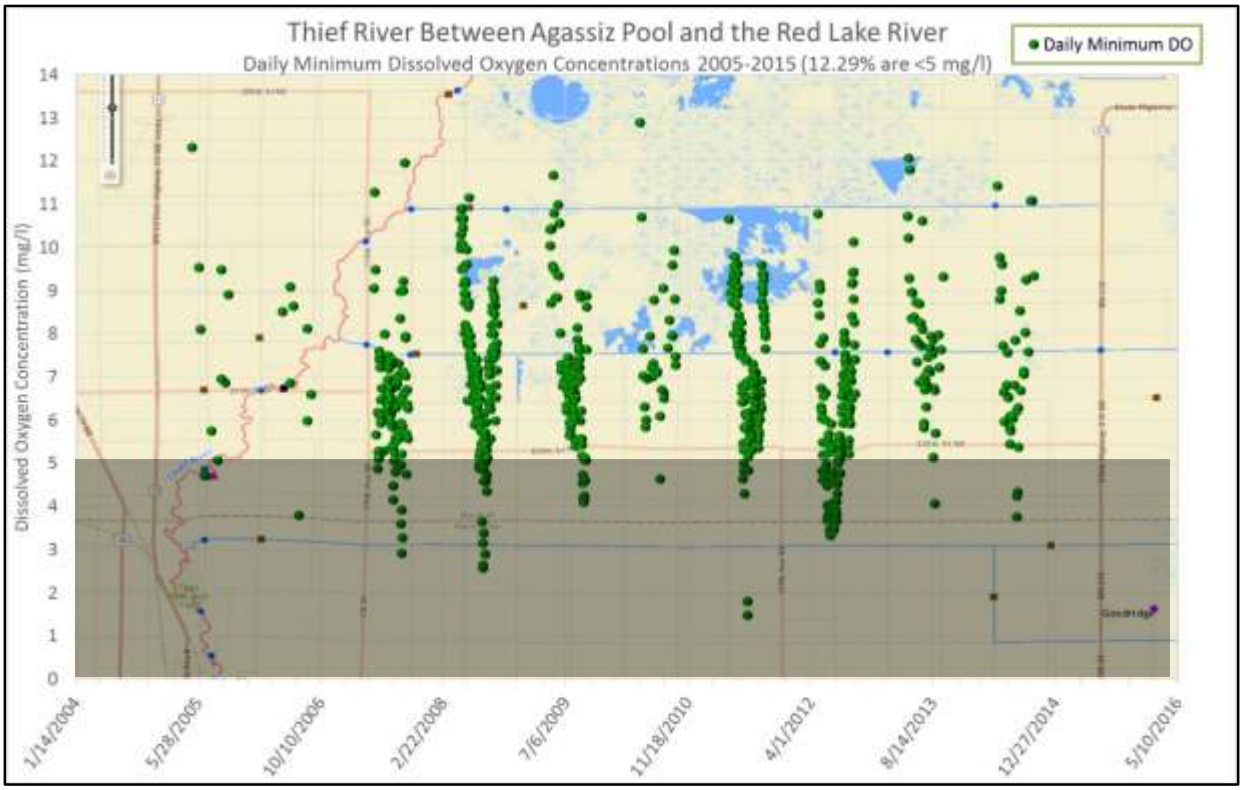

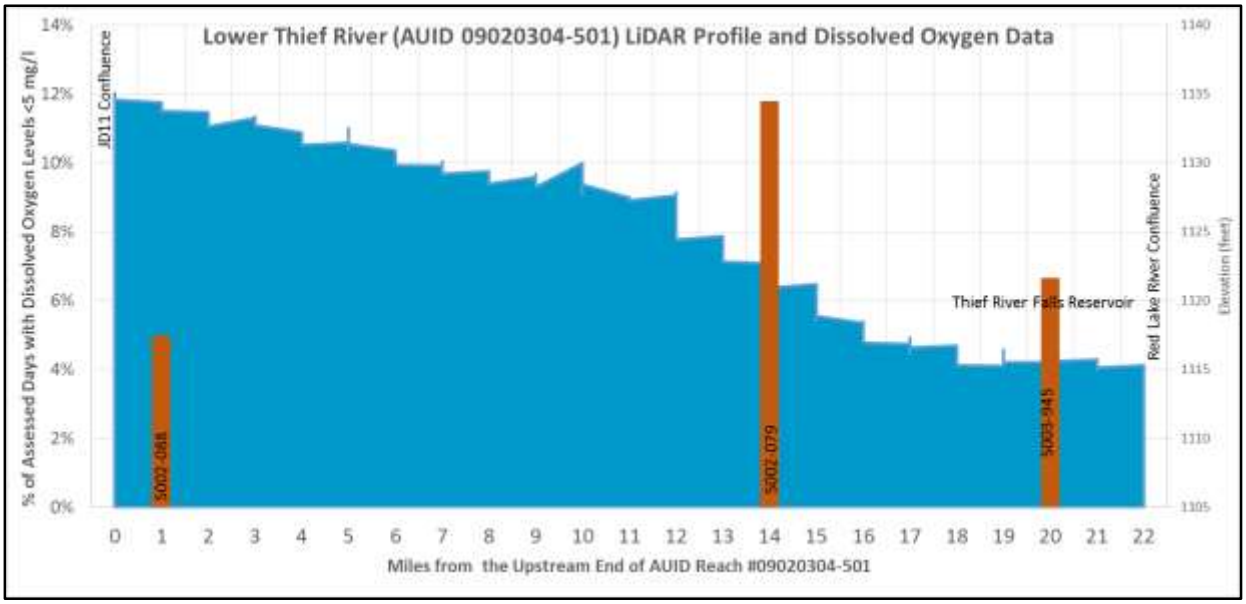

- An assessment of total suspended solids data from the Mud River was conducted prior to a May 12, 2015 project planning meeting. In the most recent 10 years of monitoring (2005-2014), the Mud River has only exceeded the 15 mg/l total suspended solids standard in 8.7% of samples. That exceedance rate needs to be under 10% to meet the standard, so this indicates that the river is meeting the standard.

- RLWD staff attempted to find a correlation between dissolved oxygen and a pollutant of concern. At site S002-079, the only parameter that correlated somewhat with dissolved oxygen was sulfates. Sulfates, however, are more of a symptom than an input. Sulfates themselves probably can't be the cause of the low dissolved oxygen levels because sulfate is already in an oxidized form (can't take any more oxygen out of the water). Hydrogen sulfide, and organic matter, however, can be oxidized and decomposed. Sulfates are the product of that decomposition and oxidization. Additional sampling on the Thief River may be needed in order to see if there is any correlation with other parameters such as total organic carbon.

- Task 11 - Civic Engagement.
  - Watershed-based web pages were launched. Emmons and Olivier Resources, Inc. staff provided RLWD staff with a tutorial of how to edit the new www.RLWDwatersheds.org web pages.
  - Once the new web pages were launched, RMB Environmental Labs staff were able to add the address to newsletters that were prepared for the purpose of updating stakeholders on the progress of the project. The newsletters were soon thereafter mailed to residents of the Thief River watershed.

- Task 13 – Reports
  - RLWD staff worked on writing the Thief River Watershed TMDL Report.

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Red Lake Watershed District Long-Term Monitoring Program

The first round of sampling at RLWD long-term monitoring sites was completed in May.

High E. coli concentrations were found in:

- Darrigan's Creek
- Heartsville Coulee
- Ruffy Brook at CSAH 11 (>2419.6 CFU/100ml)
- Browns Creek AT County Road 101

Sewage was once again found to be entering the Hill River at the CR119 crossing. This problem has been identified in the past (2005). Apparently, nothing had been done by the county or the landowners. It's not as bad as it was in 2005 and doesn't show up as well in photos, but it was easily identified by the smell and the cloudy water that was entering the Hill River.

Hill River at CR119, 2005

Hill River at CR 119, 2015

Grand Marais Creek Watershed Restoration and Protection Project

- RLWD staff reviewed and commented on a draft version of the Grand Marais Creek Stressor Identification Report.
- Red Lake DNR staff measured flow at monitoring sites within the watershed.
- Aerial photos in Google Earth (4/2/2012 imagery date) show a sharp contrast between muddy-looking water in Polk County Ditch 2 and the cleaner-looking water in Grand Marais Creek. The muddy water can be traced up to the beginning of Polk County Ditch 2 (through the CSAH 20 crossing). Polk County Ditch 66 doesn't appear to be the problem – water is relatively clear looking. The water becomes muddy looking, or turbid, somewhere along the channel that is now called RLWD Ditch 15. The channel bottom is not visible at the lower end of the Ditch 15 reach, but is visible at the Highway 75 crossing.

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Chief's Coulee Monitoring

Pennington County SWCD and RLWD staff will be collecting samples along Chief's Coulee, a drainage system on the northern part of Thief River Falls, in 2015.The first samples along Chief's Coulee were collected on May 18, 2015. At Dewey Avenue N, the E. coli concentration was 11,199 CFU/100ml! This is a record high concentration for any sample collected by the Red Lake Watershed District. Typically, anything higher than 2,419.6 is "censored" as ">2,419.6" because that is the lab's maximum reporting limit. This sample, however, was diluted 10 times prior to analysis. They're methods allow them to measure a concentration of 1,199 in the diluted sample. That concentration would then be multiplied by 10 to get the concentration of the original sample. Another interesting thing about this high concentration is that the concentration at Atlantic Avenue is a lot lower at 178.5 CFU/100ml. Much of Chief's Coulee is actually underground between those two crossings. So, where is that bacteria coming from?

Diesel range organics were detected at both the Dewey Avenue and Atlantic Ave crossings. The concentration of total suspended solids increases from 4 mg/l to 18 mg/l from Atlantic Avenue to Dewey Avenue. E. coli concentrations exceeded the chronic standard of 126 CFU/100ml at all of the sites, even at the furthest upstream site at Highway 32.

Clearwater River Surface Water Assessment Grant (SWAG)

New staff at the East Polk Soil and Water Conservation District were trained in sampling methods and requirements for the Clearwater SWAG project. Calibration supplies were purchased and distributed to project partners.

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One Watershed One Plan

- RLWD, SWCD, and BWSR staff met to review priority resources of concern, issues of concern, and ranking metrics on May 7th, 2015.
- RLWD staff helped convey 1W1P plan outline ideas by creating a draft outline based on discussion at the May 7th planning meeting.
- RLWD, SWCD, and BWSR staff met to discuss priority resources of concern, how to split up the watershed, and the plan outline on May 28th, 2015.

Other Notes

- The District hired a summer Water Quality Assistant, Claire Carlson. Her first day will be in early June.
- A retirement party for the Marshall County Water Plan Coordinator, Jan Kaspari, was held on May 28th, 2015. Jan frequently collaborated well with RLWD water quality staff on monitoring and other water quality projects. She was a great colleague in the water quality profession and also a good friend. Best wishes to her in her retirement.
- A May newsletter is available online from the Clearwater Lake Area Association: http://minnesotawaters.org/clearwaterlakearea/wp-content/uploads/sites/25/2014/06/CLAA_Dockside_May2014_ForEmail_smallersize.pdf

May Meetings/Events

- **May 7, 2015** – One Watershed One Plan planning meeting at the Red Lake Falls Wheat Growers building
- **May 12, 2015** – Mud River Project Meeting.
    - The United States Fish and Wildlife Service is planning on restoring a reach of the Mud River within Agassiz National Wildlife Refuge.
    - Funding sources?
    - The reduction of sediment within the Mud River upstream of the refuge was discussed.
- **May 28, 2015** – One Watershed One Plan planning meeting at the Red Lake Falls Wheat Growers building
- **May 29, 2015** – Target date for completion of a draft watershed TMDL for the Thief River watershed.

Upcoming Meetings/Events

- **June 2015** - Clearwater River Surface Water Assessment Grant sampling resumes.
- **June 8, 2015** – Pennington County Water Resource Advisory Committee Meeting, 9AM at the Pennington County SWCD
- **June 17, 2015** – One Watershed One Plan teleconference to discuss priority statements.

- **June 30, 2015 –** Target date for completion of a draft Thief River Watershed Restoration and Protection Strategy (WRAPS) report
- **June 30, 2015** – Semi-annual progress reports are due for the Thief River, Red Lake River, Grand Marais Creek, and Clearwater River Watershed Restoration and Protection projects.
- **July 8, 2015** – Marshall County Water Resources Advisory Committee Meeting
- **August 2015** – Hold a technical advisory meeting to review the findings in the Thief River Watershed TMDL and WRAP re
- **September 2015** – Pennington County Outdoor Education Day
- **September 2015** – Northwest Minnesota Water Festival in Fertile and Warren
- **September 2015** – Thief River Open House Meeting
- **November 4, 2015** – Marshall County Water Resources Advisory Committee Meeting
- **December 31, 2015** – End date for the Thief River Watershed Restoration and Protection Project (extended from June 30, 2015).
- **June 30, 2016** – End date for the Red Lake River Watershed Restoration and Protection Project (extended from June 30, 2015)

Plans for the rest of 2015

- Thief River Watershed Restoration and Protection Project.
    - Creating Stream Power Index maps.
    - Create a web page dedicated to the Thief River Watershed
    - Maps of HSPF model results
    - Flow characterization and load calculations
    - Pollutant identification for reaches with dissolved oxygen impairments
    - Complete a draft Thief River Watershed TMDL Report
    - Complete a draft Thief River Watershed Restoration and Protection Strategy Report
    - Technical Advisory meeting to review TMDL and WRAPS reports
    - Edit TMDL and WRAPS reports based on comments during the review process.
- Red Lake River Watershed Assessment Project
    - Creating Stream Power Index maps.
    - Create a webpage dedicated to the Red Lake River
    - Flow characterization
    - Provide input during the assessment process
    - Complete a draft Red River Watershed TMDL Report
    - Complete a draft Red River Watershed Restoration and Protection Strategy Report
    - Technical Advisory meeting to review TMDL and WRAPS reports
- Clearwater River Watershed Restoration and Protection Project
    - Assess existing data (2005-2014).
    - Determine where more data is needed.
    - Plan 2015 monitoring
    - Create a webpage dedicated to the Clearwater River watershed

  - Stage and flow measurements at sites where HOBO water level loggers are deployed.
  - Continuous dissolved oxygen data collection at a minimum of 9 sites. Consider moving sondes to new sites midway through the monitoring season if aquatic life support is verified.
- 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.
- Sampling and monitoring dissolved oxygen in the Mud River in Grygla in an attempt to better understand the blue-green algae problem that was discovered last fall. Abraxis blue-green algae testing kits were ordered.

Quote of the Month:

"Most people give up just when they're about to achieve success. They quit on the one yard line. They give up at the last minute of the game one foot from a winning touchdown."
– Ross Perot

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

Learn more about your watershed at: http://www.rlwdwatersheds.org/

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