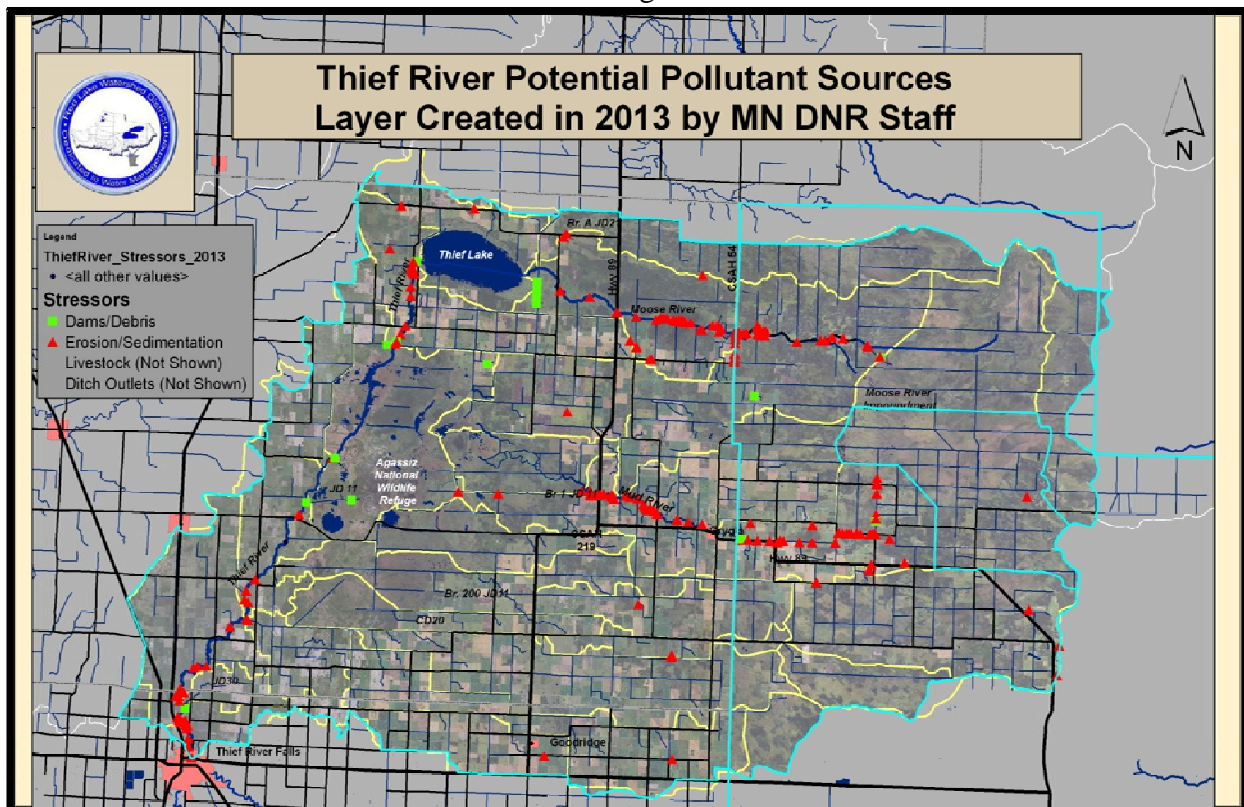


Thief River Watershed Assessment Project
(Watershed Restoration and Protection - WRAP)

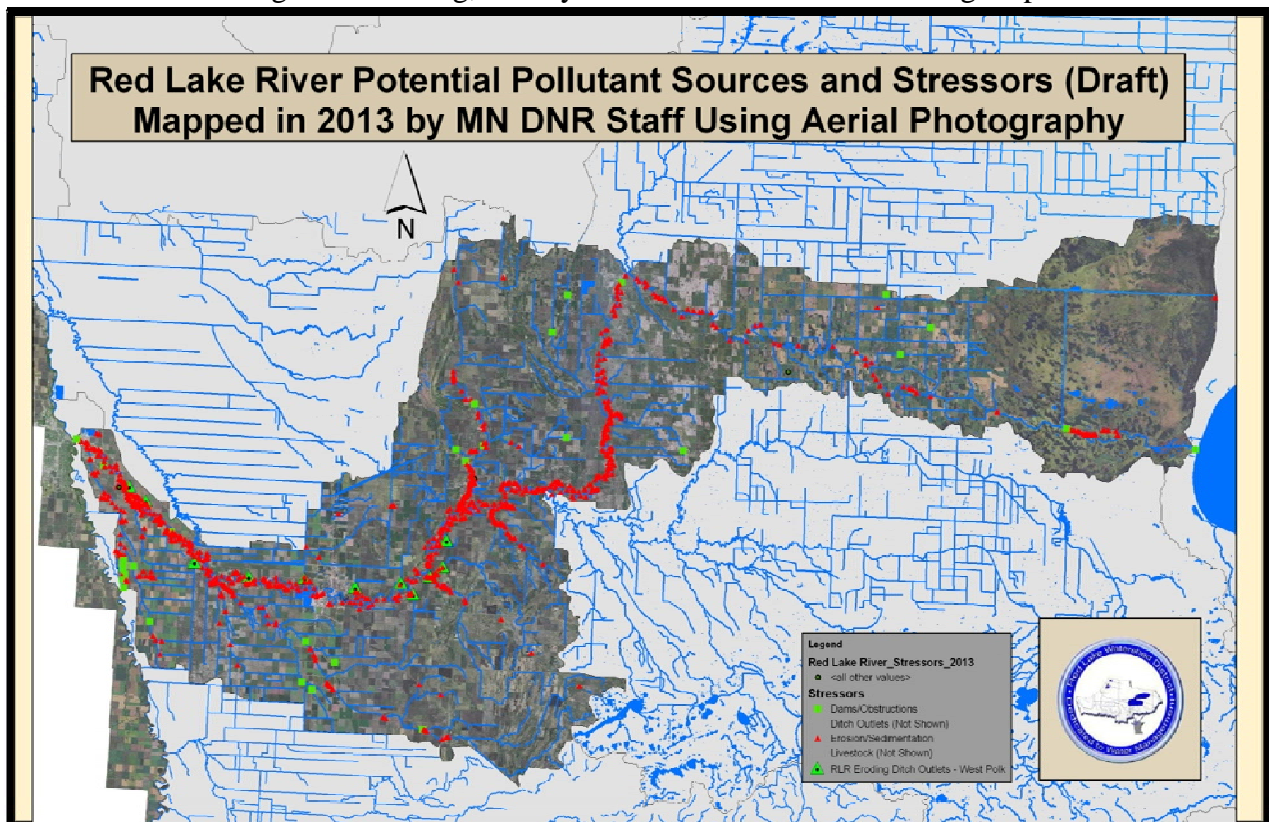
- Task 7 – Stressor Identification
 - Stephanie Klamm, MNDNR Hydrologist, created “Stressor” shapefiles in which potential sources of pollutants and other notable features in the Thief River watershed are marked. Four categories of features were marked: erosion, livestock, dams, and ditches. The marking of erosion that is visible in aerial photos will be helpful for planning projects and the marking of dams will aid projects that could improve fish passage. In order to use the marked ditches and livestock operations for planning purposes, the points will need to be significantly edited to remove “false positives” of marked farms that have some bare ground but no livestock as well as well-vegetated/stable ditch outlets.



- Task 11 – Civic Engagement
 - The next stakeholder update meeting will be held at the end of the year in November or December, after the RESPEC HSPF model, watershed conditions report, and pollutant source investigation sampling have been completed.
 - A technical advisory committee meeting will likely be held later this spring.

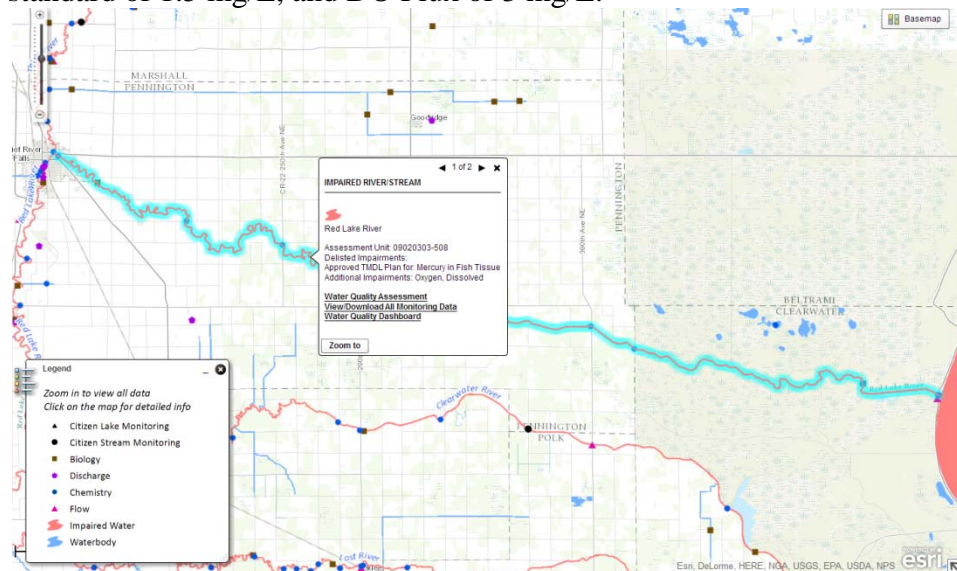
Red Lake River Watershed Assessment Project
(Watershed Restoration and Protection - WRAP)

- Task 7 – Stressor Identification
 - Stephanie Klamm, MNDNR Hydrologist, created “Stressor” shapefiles in which potential sources of pollutants and other notable features in the Red Lake River watershed are marked. Four categories of features were marked: erosion, livestock, dams, and ditches. The ditch outlet and livestock points need some editing and trimming, so they are not shown in the following map.

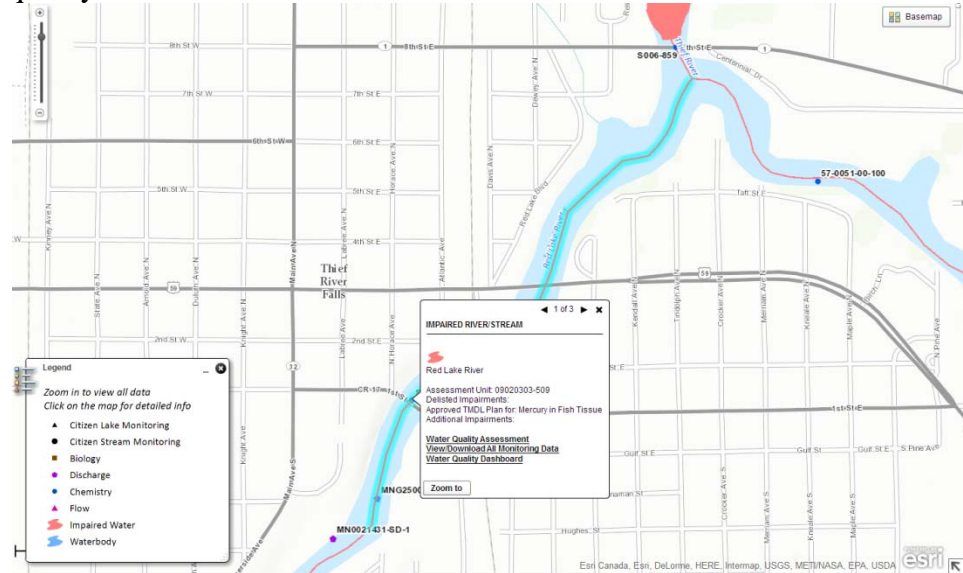


- Task 8 – Data Entry
 - During the process of assessing water quality conditions in the watershed, RLWD staff found that the Red Lake County SWCD monitoring data isn’t stored in the State’s EQUIS water quality database yet. So, this data will be submitted soon so that it can be used in this fall’s official water quality assessment.
- Task 9 – Data Analysis
 - Red Lake River assessment units (e.g. Red Lake River from Headwaters to Thief River) were reviewed for the purpose of finding real names for “unnamed” streams and ditches using county highway maps, plat books, and other maps. Changes were suggested for eighteen assessment units.
 - The official assessment of the Red Lake River watershed will be delayed until this fall due to upgrade work being done on the MPCA’s assessment software.

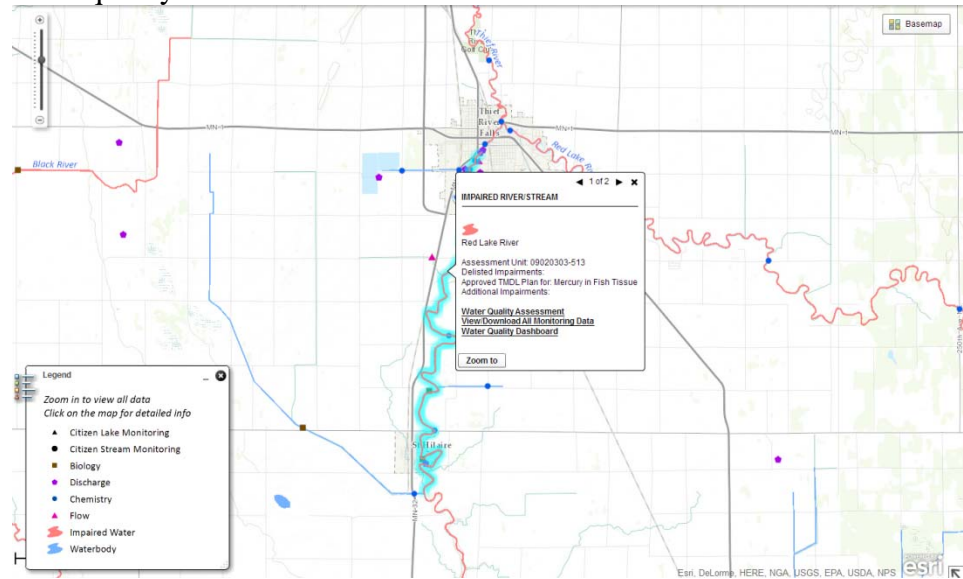
- A preliminary water quality assessment of the Red Lake River watershed was started. This local assessment will be done using State assessment methods and the TALU (Tiered Aquatic Life Use) standards that will likely replace the current standards prior to the official water quality assessment. This assessment will give the RLWD, MPCA, and project partners a “heads-up” on what to expect from the assessment and which reaches will be impaired. It will aid the planning of investigative sampling efforts during the summer of 2014.
 1. The assessment began with the upper reach of the Red Lake River that begins at the headwaters and ends at the Thief River. Monitoring data collected during site visits over the past 10 years (2004-2013 data) indicates shows that this reach of the river appears to have a few potential impairments. Continuous dissolved oxygen (DO) data collected in 2013 from May through September shows that parts of this reach are not meeting the standard for daily minimum dissolved oxygen concentrations. At CSAH 27, 60% of the 88 days that were monitored had DO levels that dropped below the 5 mg/L standard. Further downstream, at the Highlanding Bridge, 38% of the 129 recorded daily minimums were less than 5 mg/L. This does show an upstream-to-downstream improvement. So, it would be interesting to deploy a dissolved oxygen logger at the Smiley Bridge (CSAH 7) to see if the river continues to gain improved dissolved oxygen levels as it travels further downstream and past the channelized portion of the river. If the MPCA’s new TALU standards are applied to this assessment, this reach of the Red Lake River will have to meet a 15 mg/L total suspended solids standard, which it fails to meet. It also appears that it may not be meeting the proposed eutrophication standards that include a total phosphorus standard of 50 ug/L, BOD standard of 1.5 mg/L, and DO Flux of 3 mg/L.



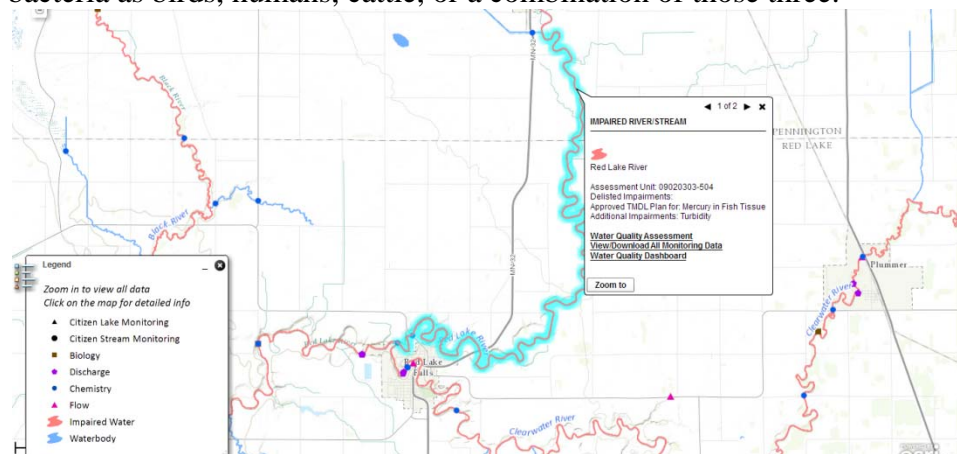
- The Red Lake River reach between the Thief River confluence and the Thief River Falls Dam appears to be meeting all of the conventional water quality standards.



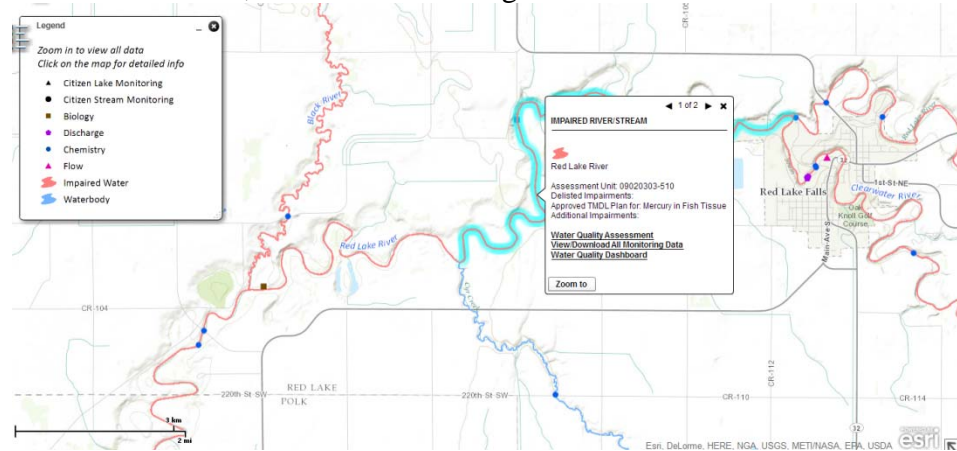
- The Red Lake River reach between the Thief River Falls Dam and Pennington County Ditch 96 appears to be meeting all of the conventional water quality standards.



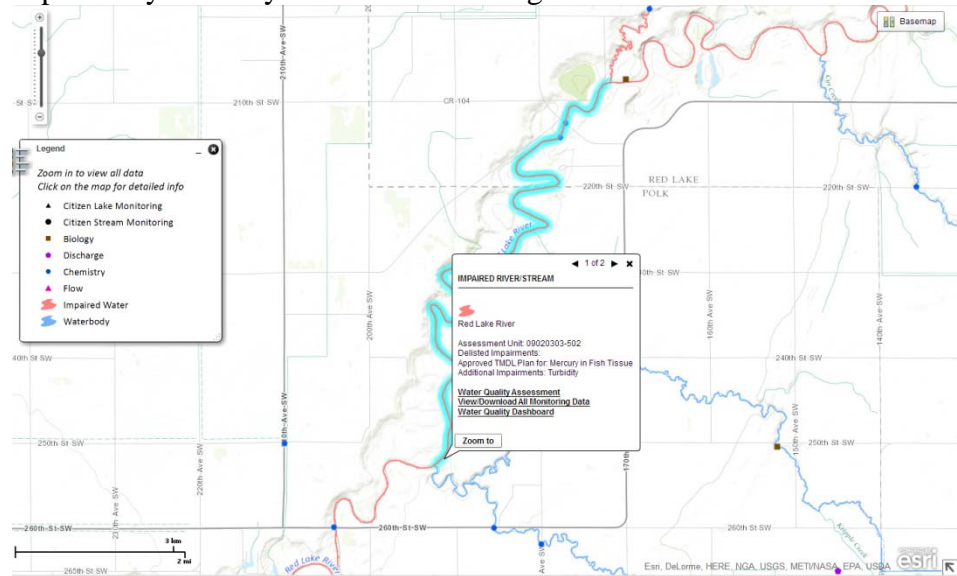
- The CD96 to Clearwater River reach of the Red Lake River is still impaired by turbidity (although that standard won't be used anymore) and will also fail to meet the new TSS standard this coming fall. There is a potential impairment for E. coli bacteria on this reach during the month of June. Most of this data was collected at the CSAH 13 Bridge near the Voyageur's View Campground. This is especially concerning because of the tubing business that operates on the lower end of this reach. One potential source of E. coli in the samples taken from that particular bridge is cliff swallow waste. In 2013, the cliff swallows are present in "swarms" during the June sampling, but there were much fewer birds by the bridge during the July sampling. The monthly geometric mean E. coli concentrations for the months of July, August, and September are significantly less than the month of June. In June 2014, samples may be collected and sent to a lab for DNA analysis to confirm the source of bacteria as birds, humans, cattle, or a combination of those three.



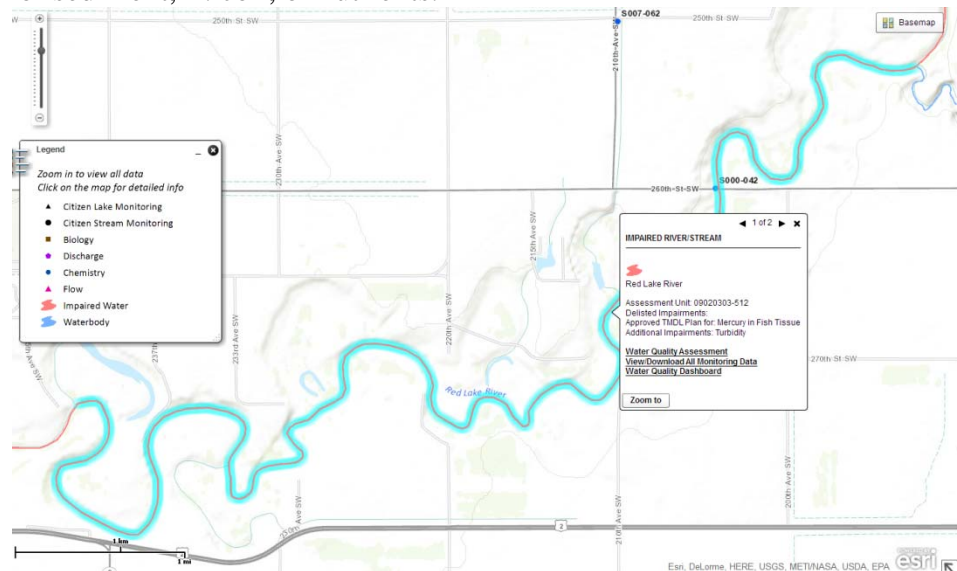
- There are two assessment units of the Red Lake River that are designated between the Clearwater River confluence to the Cyr Creek confluence, and then to the Black River confluence. There are no crossings along this stretch of the river, so there's not enough data to assess this reach either.



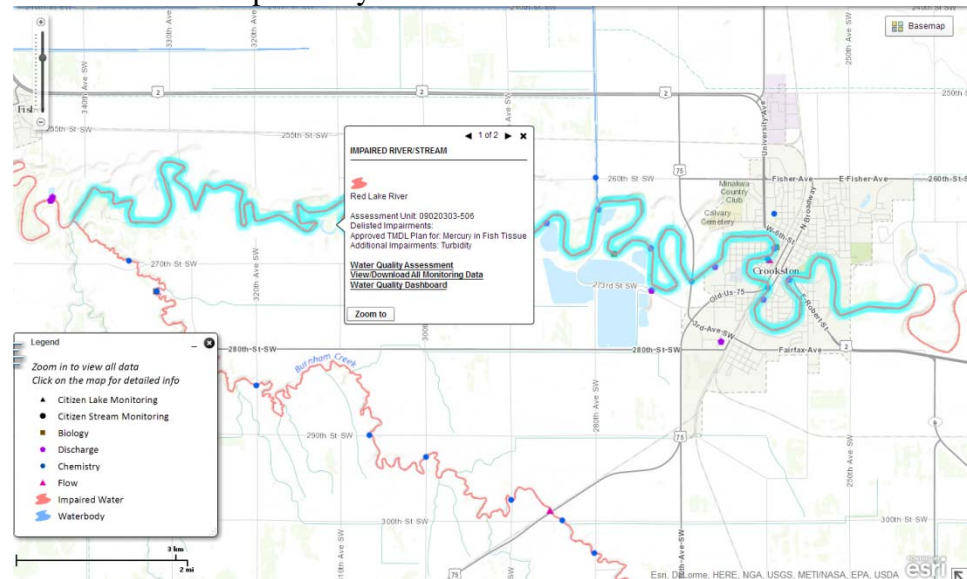
6. Red Lake County SWCD and River Watch data is available to assess the reach of the Red Lake River that is located between the Black River confluence and the Gently River confluence. It appears to still be impaired by turbidity and to be exceeding the new TSS standard.



7. Between the Gently River and Polk County Ditch 99 (east side of Crookston), Crookston River Watch data shows that the river is still impaired by turbidity. There isn't enough sampling data to assess the reach for sediment, E. coli, or nutrients.



8. Between CD99 and the Burnham Creek confluence, enough turbidity and TSS data points collected along the Red Lake River exceed their respective standards to classify this reach as impaired. This means the reach's turbidity impairment won't be delisted any time soon and it may also be listed as impaired by TSS.



- Task 10 – Civic Engagement
 - The next stakeholder update meeting will be held at the end of the year in November or December, after the HSPF model, water quality assessment, biological assessment, stream power index layer, and stressor identification sampling have been completed.
 - A technical advisory committee meeting will likely be held later this spring.

Clearwater River Watershed Projects (WRAP, SWAG, Data Submittal)

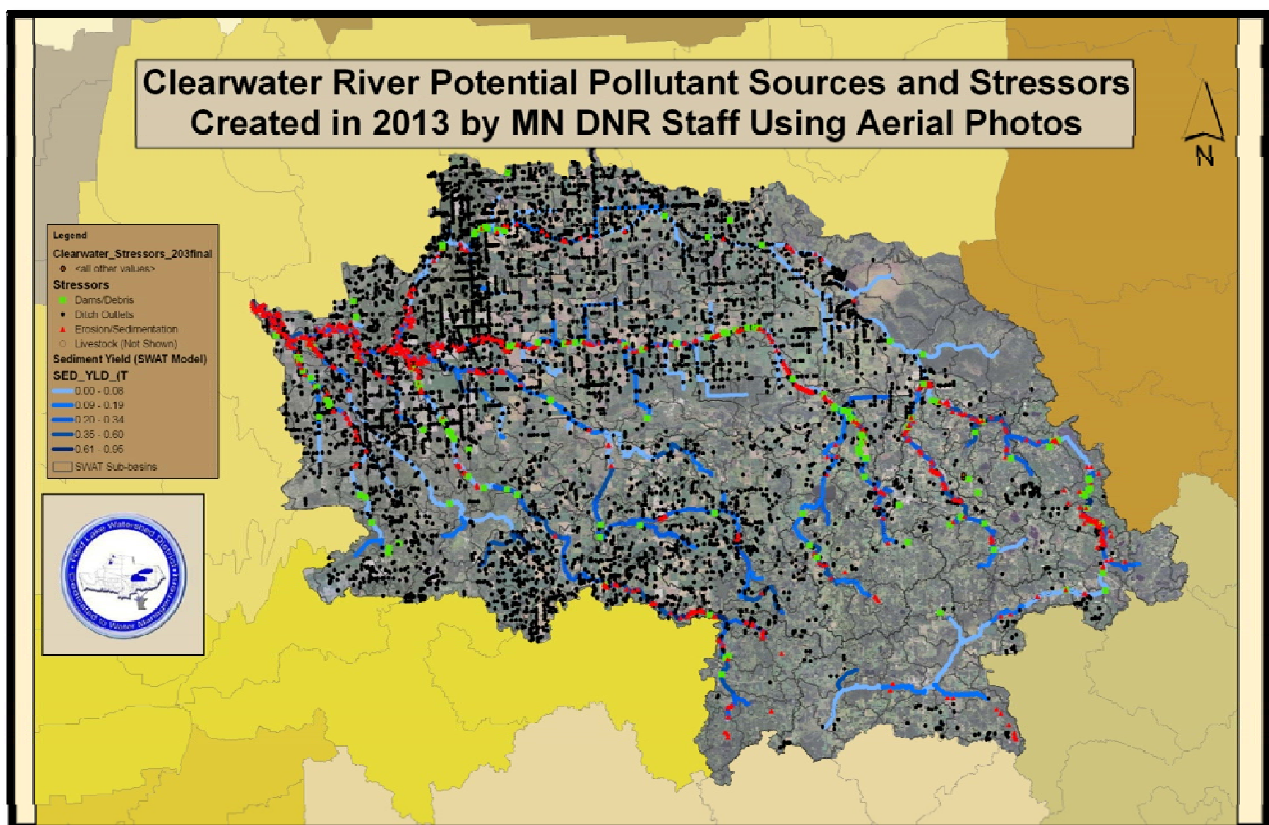
A Clean Water Fund grant for Surface Water Assessment Grant (SWAG) monitoring was awarded to the Red Lake Watershed District and project partners for the Clearwater River Watershed SWAG. The Red Lake Watershed District will work with the Clearwater Soil and Water Conservation District (SWCD), Red Lake SWCD, and East Polk SWCD to monitor 15 sites throughout the watershed. The RLWD Board of Managers approved the signing of a contract with the MPCA for this work at their February 27th meeting.

Final edits and changes were made to the Clearwater River Watershed Restoration and Protection project's work plan, budget, and schedule. The Red Lake Watershed District Board of Managers approved the work plan/budget and the signing of the contract at their February 13th meeting. MPCA, RMB Environmental Laboratories, and RLWD staff met to discuss the civic engagement work that will be done during the Clearwater River WRAP.

It was learned that the MPCA plans to conduct some continuous dissolved oxygen monitoring within the Clearwater River watershed during July and August of 2014. They currently plan to

deploy dissolved oxygen logging sondes in the Clearwater River at CSAH 2 (east of Bagley), Clearwater River at CR127 (lower end of the channelized reach), Clearwater River at the Klondike Bridge in Red Lake Falls, Lost River near Brooks, Hill River near Brooks, and Lower Badger Creek.

Stephanie Klamm, MNDNR Hydrologist, created “Stressor” shapefiles in which potential sources of pollutants and other notable features in the Clearwater River watershed are marked. Four categories of features were marked: erosion, livestock, dams, and ditches. The marking of erosion that is visible in aerial photos will be helpful for planning projects and the marking of dams will aid projects that could improve fish passage. In order to use the marked ditches and livestock operations can be usefully mapped for planning purposes the points will need to be significantly edited to remove “false positives” of marked farms that have some bare ground but no livestock and well-vegetated/stable ditch outlets. Even though just a subset of the marked ditches have erosion problems, it is interesting to see how the density of agricultural ditches greatly increases from the eastern side of the watershed to the western side.



Grand Marais Creek Watershed Restoration and Protection Project

The existing Grand Marais Creek assessment units (e.g. Grand Marais Creek from CD2 to Red River) were reviewed for the purpose of finding real names for “unnamed” streams and ditches in reach descriptions using county highway maps, plat books, and other maps. Changes were suggested for three assessment units.

Stream Gauging

2007 through 2013 flow records for Silver Creek were provided to staff at the Detroit Lakes MPCA office that are going to try to get some flow data collected by local government agencies stored in the State government’s HYDSTRA database. So far, only data collected by State agencies has been stored in this database. Collecting flow data from local agencies will increase the number of streams that are represented in the database and increase the amount of data that is available for hydrologic and water quality modeling efforts.

Flow measurement data collected over the years by RLWD staff at sites that are part of the Major watershed Pollutant Load Monitoring Network (MWPLMN) was sent to MPCA and DNR staff. These sites included the 320th Avenue crossing of Burnham Creek, 180th Avenue crossing of Kripple Creek, CSAH 7 crossing of the Thief River, and the CR119 crossing of the Lost River

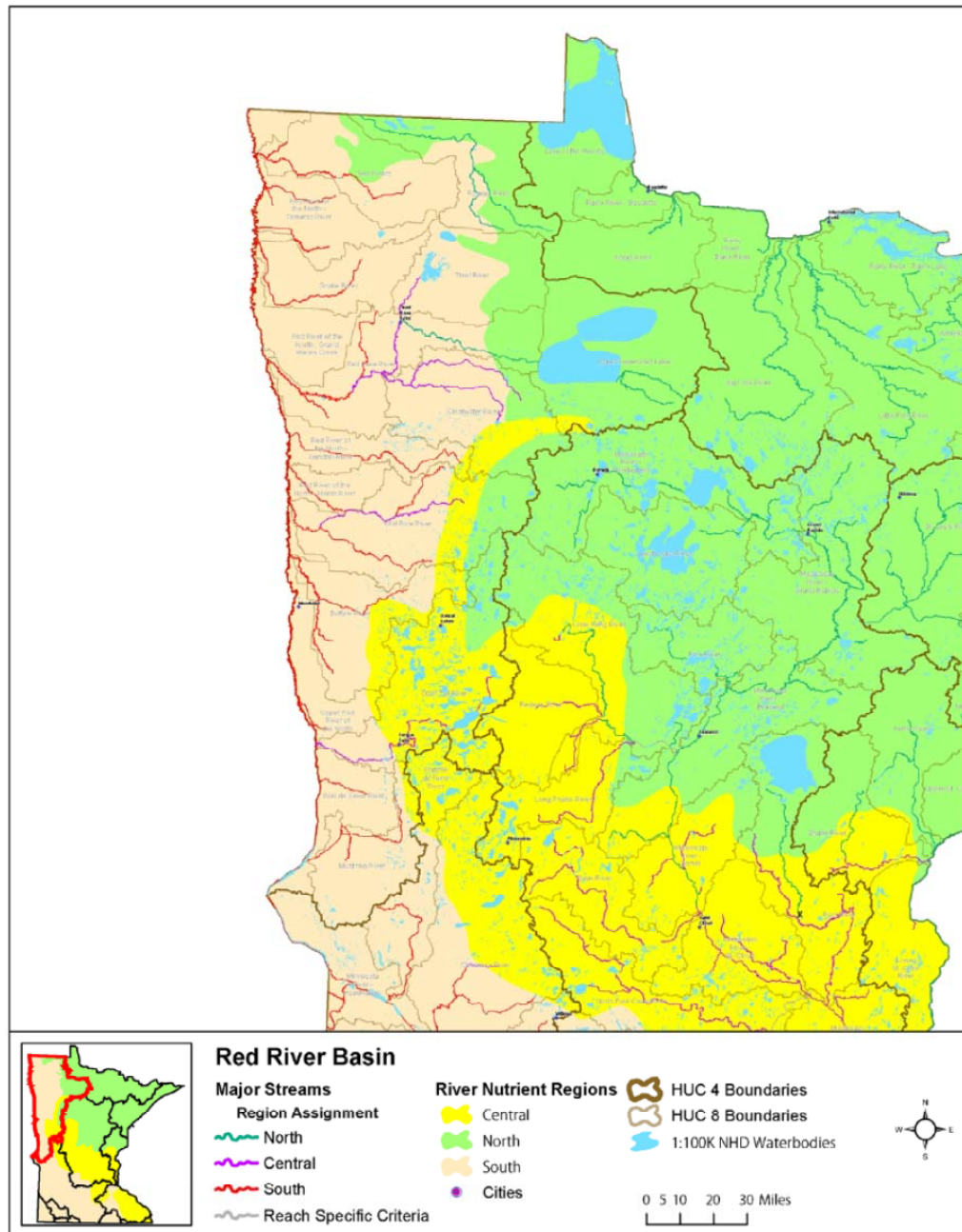
Other Notes

- MPCA Triennial Standards Review and State Water Quality Standard Changes
 - Tiered Aquatic Life Use (TALU) standards will be implemented: This is a restructuring of the water quality standards that recognizes that the expectations for streams should vary based on the natural features of the streams’ aquatic ecosystems. Instead of treating Class 2 streams equally, they will be separated into four classes. Biological and chemical goals for each of the new classes will be more appropriately matched with the potential of a particular stream in a particular class in a particular region of the state.



- o Different water quality standards will be applied to different regions of the state.

River Nutrient Regions and Stream Assignments



- o Total Suspended Solids (TSS)
 - The “North” standards will require that streams meet a standard for TSS that is more stringent than the current 25 NTU turbidity standard. It approximately correlates to a turbidity level of 11.5 NTRU or 17 FNU based on RLWD data. This provides greater protection for streams that should have very good water quality. In the RLWD, this standard applies

to the whole of the Upper and Lower Red Lakes watershed, part of the Clearwater River, and the Red Lake River upstream of Thief River Falls.

- The 30 mg/L standard that is in place for reaches of the Thief River, Red Lake River (Thief River to Burnham Creek), Clearwater River, and Lost River correlates very closely with the current 25 NTU turbidity standard.
- The “South” region’s TSS standard (65 mg/L) applies a more realistic water quality standard to streams that naturally have a significant amount of suspended sediment and turbidity. The comparable turbidity value for this TSS standard could vary based on location and which outlying values are eliminated from the correlation, but RLWD data indicates that the 65 mg/L TSS standard appears to be roughly equal to a turbidity level of 60 NTU, which is more than twice as high as the previous standard. This standard will apply to a bunch of rivers in the Red River Valley ecoregion. In the RLWD, it appears that this standard will apply to the Black River, Burnham Creek, and the Red Lake River downstream of Burnham Creek.

Table 3.1 Biological and Chemical Summaries by Region:

Regional water quality criteria (mg TSS/L)	Reference or least impacted TSS water quality data statistical test recommendations	Fish and invertebrate Index of Biotic Integrity statistical test recommendations	Combined & rounded as appropriate
All Class 2A waters (Trout Streams)		7	10
Northern River Nutrient Region	16	14	15
Central River Nutrient Region	31	24	30
Southern Nutrient Region	60	66	65
Red River mainstem – Headwaters to Border	100		100

For the criteria above, concentration can be exceeded no more than 10 percent of the time. The assessment season is April through September

- Eutrophication
 - Total Phosphorus
 - Biochemical oxygen demand (BOD)
 - The North Region BOD standard of 1.5 mg/l will be hard for any of the river in the RLWD to meet because it is actually lower than the lab’s minimum reporting limit. The lowest BOD values we see in lab reports are <2 mg/l.
 - Dissolved oxygen flux (difference between the daily maximum and the daily minimum).

- Chlorophyll-a – this is usually only collected at the lower end of larger rivers (Klondike Bridge in Red Lake Falls, Thief River nor

Table 11. Draft river eutrophication standards ranges by River Nutrient Region for Minnesota and site-specific values for specific river AUIDs.

Region	Nutrient		Stressor	
	TP µg/L	Chl-a µg/L	DO flux mg/L	BOD ₅ mg/L
North	≤50	≤7	≤3.0	≤1.5
Central	≤100	≤18	≤3.5	≤2.0
South	≤150	≤35	≤4.5	≤3.0
Crow Wing River (AUIDs 07010106-507, -506, & -501)	≤75	≤13	≤3.5	≤1.7
Crow River (AUID 07010204-502)	≤125	≤27	≤4.0	≤2.5

- The USGS has chosen the Clearwater River watershed as one of the watersheds around the state for bedload sampling.
- Annual report articles about 2013 water quality projects were completed.
- News from the Red Lake Department of Natural Resources' Winter Newsletter:
 - A stream restoration and fish passage was completed on the Mud River at the Highway 1 crossing in Redby. There used to be a dam under the bridge. Now, a series of rock riffles will stabilize the stream and allow fish passage. "For the first time in 90 years, the Mud River stream was re-connected to the lake for fish passage. This spring, walleyes will be able to swim upstream to spawn. The RL DNR Water Resources program is monitoring the effects of the stream restoration through water quality sampling, bioassessment, mussel surveys, and vegetation assessments."



New Mud River Bridge

February Meetings/Events

- **February 3, 2014** – WRAP project progress reports are due.
- **February 28, 2014** – Red River Basin Monitoring Advisory Committee meeting at the Sand hill Watershed District in Fertile.
 - Overview of Minnesota River Sediment Research – Stephanie Day (NDSU)
 - Although they're not a guarantee of future stability, the types of vegetation on stream banks can act as good indicators of the length of time that a stream bank has been stable: grass (relatively short time), brush (a little longer), and trees (a significant amount of time).
 - Photogrammetry (measurements based upon aerial photographs) was used to measure the retreat rates of bluffs along the river.
 - Terrestrial Laser Scanning (TLS) was also used to accurately scan bluff profiles and measure erosion over time. This process was time consuming and the TLS equipment is expensive, but it is highly accurate (millimeter accuracy).
 - LIDAR was used to estimate the amount of sediment that has been “excavated” from ravines by erosion.
 - Knowing the rates at which bluffs are moving will aid the planners – making sure that people don't build too close to the river.
 - Pre-settlement (Holocene) and present erosion rates were compared. Upland and ravine erosion went from a minimal level prior to settlement to a much more significant level after settlement. Bluff erosion increased greatly after settlement.
 - MN Department of Agriculture Pesticide Monitoring – Luke Stuewe (MDA)
 - The MDA has been conducting precipitation monitoring to check for atrazine.
 - 232 locations have been monitored in the Red River Basin.
 - Grand Marais Creek is considered to be impaired by chlorpyrifos.
 - There is another chlorpyrifos impairment in the Red River Basin in the Tamarac River.
 - More information is available on the MDA monitoring website: <http://www.mda.state.mn.us/monitoring>
 - MPCA Biological Assessments – Dave Dollinger (MPCA)
 - A report is being written about the Thief River assessment.
 - 80% of the channels in the Thief River watershed are affected by channelization, the 3rd highest percentage in the State.
 - Assessment of the Red Lake River watershed is being delayed until this fall due to a software crash.
 - The MPCA would like to hold an April kick-off meeting for the biological monitoring that is planned in the Clearwater River watershed and the Upper/Lower Red Lakes watershed.
 - RRBC Nutrient Management Project – Joe Courneya (RRBC)
 - The feasibility of cattail harvesting is being investigated.

- RRBC is also starting to work on a basin-wide plan for preventing the spread of aquatic invasive species
- Updates from committee members
 - The Major Watershed Pollutant Load Monitoring Network monitoring work was discussed. Site locations and preliminary results (sediment and nutrient yields) can be found on this website:
<http://www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/streams-and-rivers/watershed-pollutant-load-monitoring-network.html>.
 - International Water Institute staff will be conducting mercury sampling at some of their load monitoring sites.
 - The Red Lake DNR will be conducting SWAG sampling in the Upper/Lower Red lakes watershed and helping the MPCA with biological sampling.

Plans for March and April 2014

- Thief River Watershed Restoration and Protection Project.
 - Creating Stream Power Index maps.
 - Create a web page dedicated to the Thief River Watershed
 - Flow characterization
 - Finish a summary of existing data
 - Work on writing WRAPS report
 - Technical Advisory Committee meeting
- Red Lake River Watershed Assessment Project
 - Create a webpage dedicated to the Red Lake River
 - Flow characterization
 - Finish assessing water quality conditions based upon 2004-2013 data.
 - Finish a summary of existing data that will include the assessment results.
 - Plan 2014 monitoring
 - Begin writing parts of the WRAPS report
 - Technical Advisory Committee meeting
- Contract with the Red Lake DNR for flow measurements in the Grand Marais Creek and Clearwater River watersheds.
- Annual Water Quality Training session

Upcoming Meetings/Events

- **March 5th, 2014** – Annual Red River Basin Water Quality Monitoring Training Session at the University of Minnesota, Crookston
- **March 6th, 2014** – One Watershed One Plan discussion at the Pennington County Soil and Water Conservation District office.
- **March 10th, 2014** - Pennington County Water Resources Advisory Committee

- **March 12, 2014** – Minnesota Flood Damage Reduction Work Group Project Monitoring Committee meeting in Detroit Lakes
- **March 17, 2014** – RLWD Overall Advisory Committee Meeting
- **May 6-9 and 12-15, 2014** – Clearwater River geomorphology reconnaissance
- **May 31, 2014** – Thief River and Red Lake River HSPF models are due to be completed by RESPEC.
- **June 9-12, 2014** - Clearwater River geomorphology reconnaissance
- **June 30, 2014** – Clearwater River HSPF model should be completely finalized.
- **July 7-11, 2014** – Clearwater River geomorphology
- **July 21-24, 2014** – Clearwater River geomorphology
- **August 11-15, 2014** – Clearwater River geomorphology

Quotes of the Month:

“Instead of worrying about what people say of you, why not spend time trying to accomplish something they will admire?”

– Dale Carnegie

“Difficulties are meant to rouse, not discourage. The human spirit is to grow strong by conflict.”

– William Ellery Channing

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.