

### **District Monitoring**

- Most of the second round of sampling for the Red Lake Watershed District's long-term water quality monitoring program was completed in June.
- High E. coli concentrations were found:
  - Thief River
  - Marshall County Ditch 20
  - Poplar River
  - Blackduck River Watershed
    - Darrigan's Creek (very high)
    - O' Briens Creek (very high)
    - South Cormorant River (very high)
    - North Cormorant River (very high)
  - Gentilly Creek
  - Kripple Creek (total of three high levels recorded this June)
  - Cyr Creek
  - Hill River
  - Black River (total of three high levels recorded this June)
  - Clearwater River near Bagley
  - Silver Creek near the town of Clearbrook

### **Thief River Watershed Assessment Project (Watershed Restoration and Protection)**

- Task 2 – Water Quality Monitoring
  - Water quality samples were collected at continuous dissolved oxygen monitoring sites in June.
  - Water levels in the Thief River watershed were very low.
  - Extra samples were collected from Judicial Ditch 30 because of a potential E. coli impairment in the month of June. The extra set of samples also adds to the data that can be used to correlate a pollutant with the continuous dissolved oxygen data. This month's E. coli sampling gives us enough data for an assessment and shows that the ditch is currently meeting the State E. coli standard during the month of June, even though one of the four samples collected this month was 218.7 MPN/100 ml (higher than the 126 MPN/100 ml monthly geometric mean standard).
- Task 3 – Continuous Water Quality Monitoring.
  - Eureka Manta and Manta 2 multi-parameter sondes were deployed at five sites throughout the Thief River watershed. They are deployed in the Thief River, JD30, Branch A of JD21, Moose River, and Mud River. Every two weeks, the deployed sondes are retrieved and replaced with clean, freshly calibrated sondes. The formerly deployed sondes are



- then brought back to the lab for data downloading, cleaning, and calibration.
- The Mud River Manta deployment pipe was moved to a deeper part of the channel where there will hopefully be enough water to submerge the sensors during the low water levels that we are seeing this year.
  - Task 5 – Stage and Flow Monitoring
    - A flow measurement was made in Judicial Ditch 30 after a rain event.
  - Task 8 – HSPF Modeling
    - Houston Engineering has completed the hydrologic calibration of the HSPF model of the Thief River Watershed. They have provided project partners with a Final Hydrologic Calibration Report. Here are some figures from the report that show how well the watershed was represented by the model. Overall, the model appears to do a good job at predicting flows from the entire watershed. When it comes to predicting flows at specific points throughout the watershed, it did well in some areas (Agassiz Pool outflows) and not as well in others (Moose River Impoundment outflows).

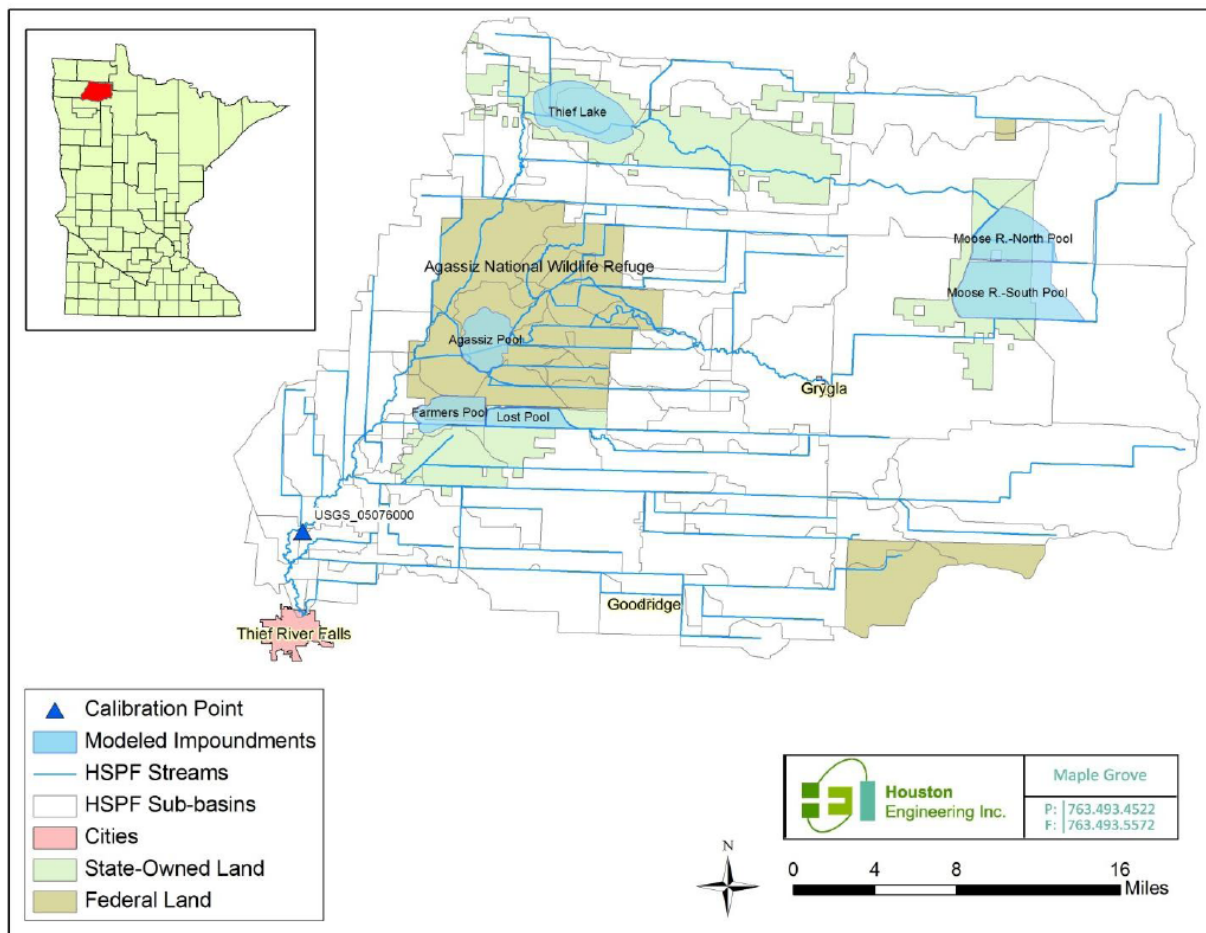


Figure 1: Represented Sub-Basins, Reaches, and Impoundments of the Thief River Watershed.

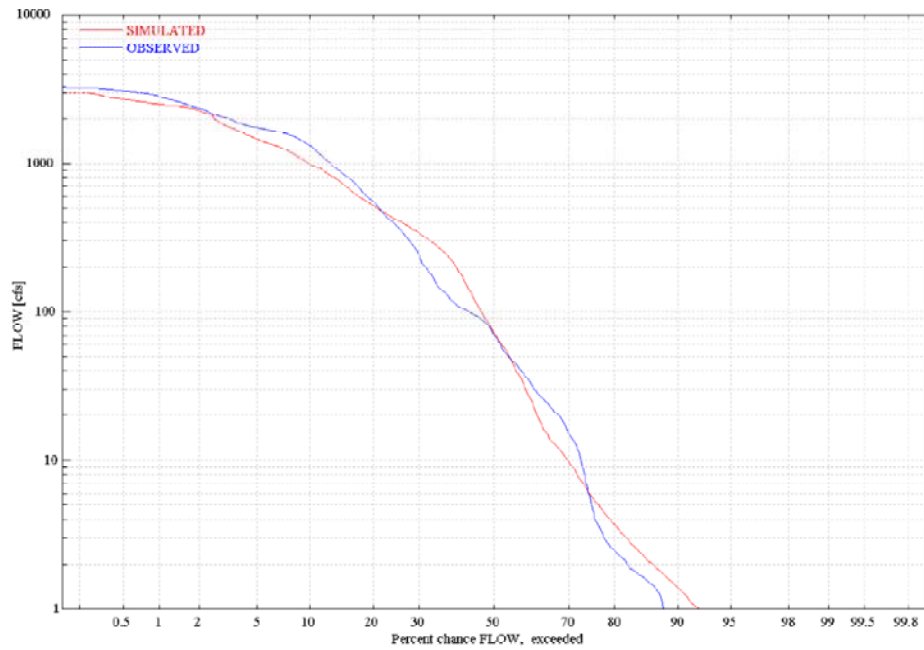


Figure 4: Flow Duration Curve for the Calibration Period (2001-2006) for the Thief River at Thief River Falls, MN.

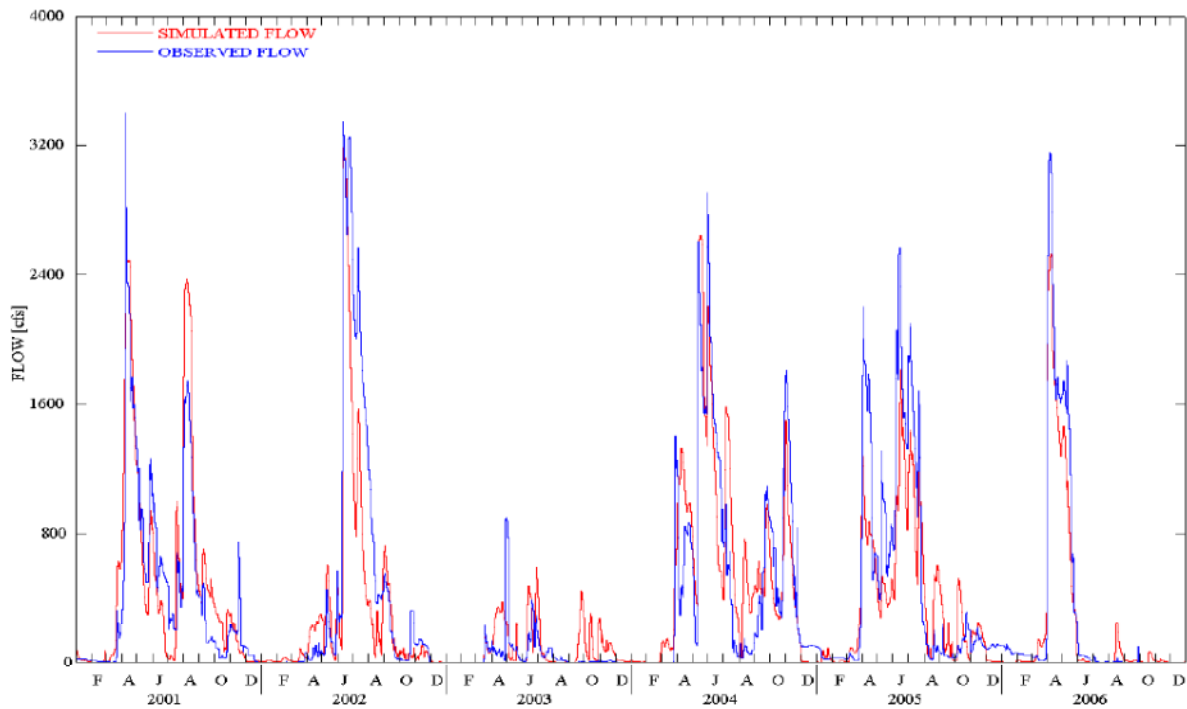


Figure 6: Daily Flows for Calibration Period (2001-2006) from the HSPF Model of Thief River at Thief River Falls.

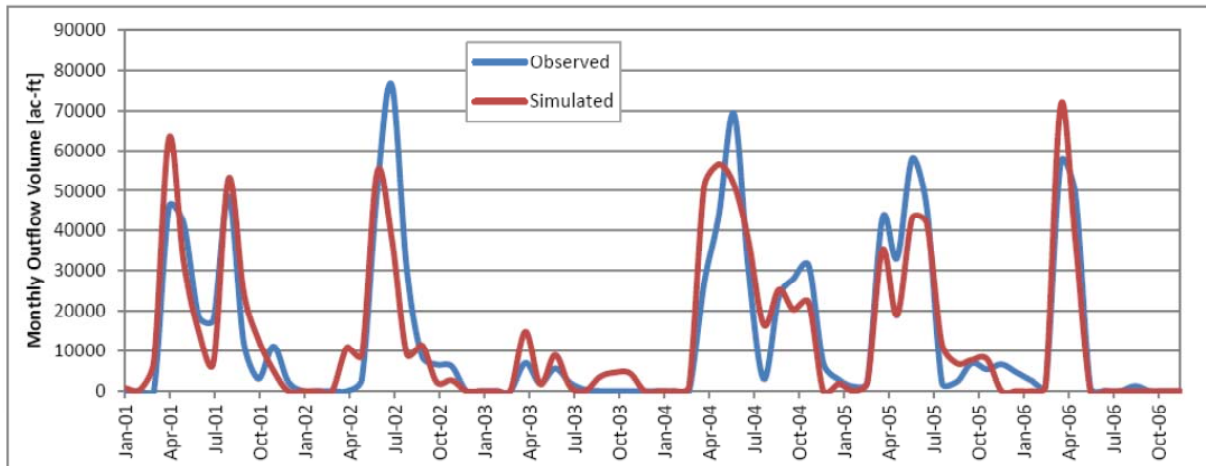


Figure 10: Monthly Outflows for the Agassiz Pool in the TRW.

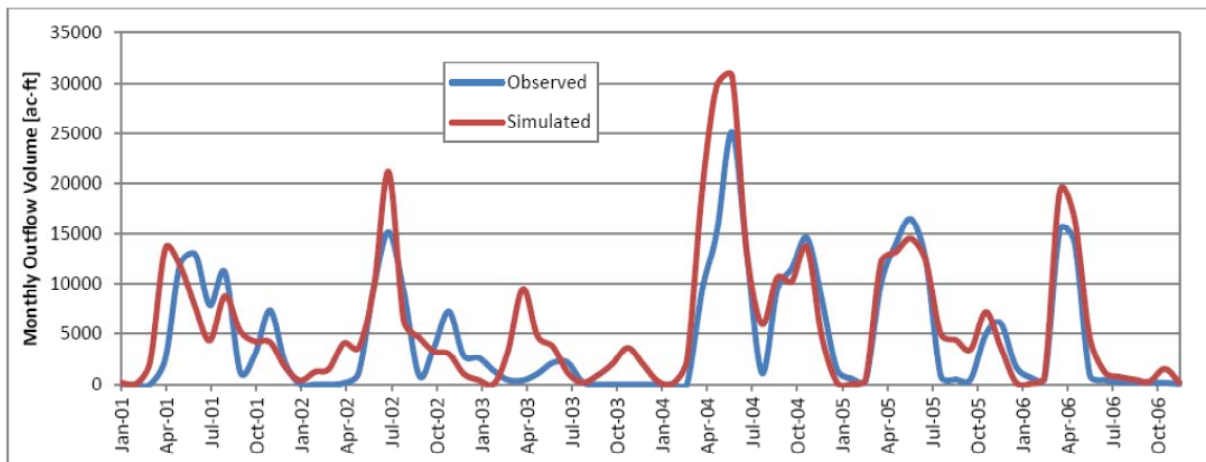


Figure 11: Monthly Outflows for Thief Lake Impoundment in the TRW.

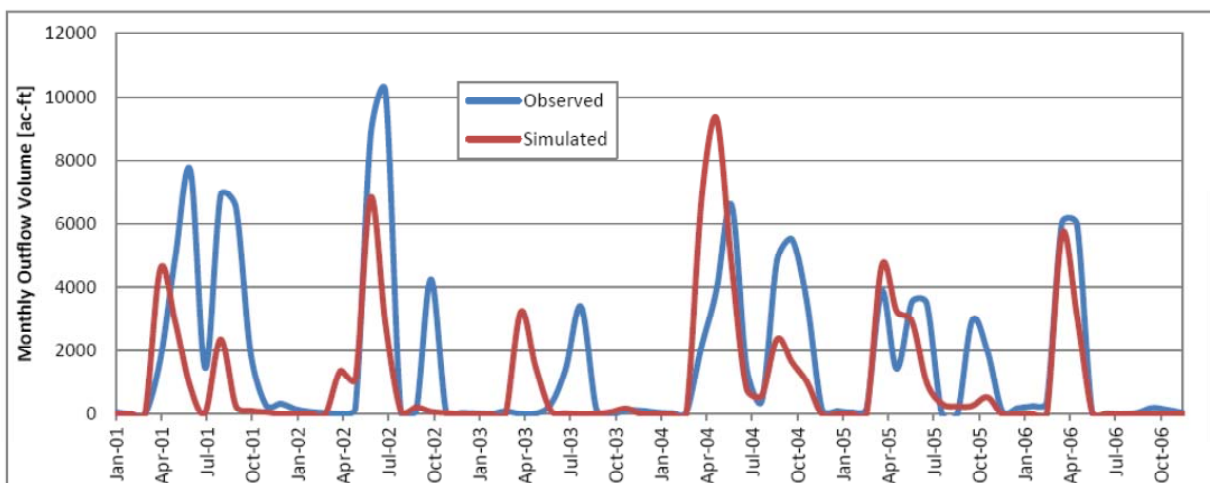


Figure 13: Monthly Outflows for the Moose River Impoundment-North Pool in the TRW.

- Task 11 – Civic Engagement
  - A blog has been started for the Thief River watershed
    - <http://thiefriver.posterous.com/>
  - A landowners' meeting was held for the Marshall County Soil and Water Conservation District's Thief River Buffer Initiative.
- Task 12 – Identification of Sources and Solutions
  - Alisha Mosloff worked on a culvert inventory of the Thief River watershed while James Blix continued to use that culvert location information to hydro-correct the LIDAR surface that will be used to conduct stream power index (SPI) analysis of the watershed. They are getting close to finishing the first stage of the Thief River terrain analysis work, which is the creation of the digital "surface" that will be used to model sub-watershed boundaries and flow paths.
  - The erosion that has occurred in Branch 23 of JD21 (east side of Hwy 54, north of Grygla) not only created plumes of suspended sediment in the Moose River, but has also contributed a lot of sediment deposition where Branch 23 of JD21 meets the Moose River (JD21). The sediment deposition is visible during the low water in the following photo. You can see that water has cut a meandering channel through the mud in the ditch at the confluence. The sediment bar in the Moose River also seems to have grown.



**Red Lake River Watershed Assessment Project (Watershed Restoration and Protection)**

- Task 1 – Evaluation of existing data
  - Some more progress was made on the existing data summary report. There is less than one day's worth of work left on this report.
- Task 2 – Water Quality Monitoring
  - Pre-9AM field measurements were made at the Smiley Bridge (CR7) monitoring site on the Red Lake River. Pre-9am dissolved oxygen measurements are needed in order to confidently declare that a river is meeting the State's dissolved oxygen water quality standard. The Smiley Bridge is close to the RLWD office in Thief River Falls, so it will be possible to get equipment calibrated and get to the site before 9am. This will be done several times each month throughout this summer.
  - WRAP funds were used to add E. coli analysis to samples collected for the Red Lake River Surface Water Assessment Grant. Biochemical oxygen demand, chemical oxygen demand, and orthophosphorus were added to the analysis of samples from sites at which dissolved oxygen loggers are deployed.
- Task 3 – Continuous Water Quality Monitoring
  - Eureka Midge dissolved oxygen loggers were deployed at 5 sites throughout the Red Lake River watershed (Heartsville Coulee, Burnham Creek, Polk CD1, Kripple Creek, and Gentilly Creek). TROLL 9500 dissolved oxygen loggers with optical dissolved oxygen sensors will be deployed in the Black River this year.
  - After two weeks of deployment, sondes are retrieved and replaced with clean, freshly calibrated equipment. They are then brought back to the lab where data is downloaded, sondes are cleaned, membranes are replaced, and dissolved oxygen sensors are re-calibrated.
- Task 5 – Flow monitoring
  - Despite a significant rain event in the eastern part of the watershed, stage levels in streams didn't change much. The land was dry enough to absorb most of the rainfall and there wasn't much runoff.
- Task 6 – Stream Channel Stability Assessment
  - Bank Erosion Hazard Index measurements were collected along four reaches of the Red Lake River upstream (east) of Thief River Falls.
    - River Valley access to the Highlanding access.
    - Downstream of Highlanding (not quite all the way to Kratka).
    - 240<sup>th</sup> Ave to the Smiley Bridge.
    - Forsberg Park to Finsbury Park



- While kayaking down the river, DNR, RLWD, and MPCA staff collected notes on study bank height, root depth, root density, bankfull height, bank angle, bank material, substrate material, channel depth, and channel width.
- Task 10 – Civic Engagement
  - A blog has been started for the Red Lake River watershed
    - <http://redlakeriver.posterous.com/>
- Task 11 – Identification of Sources and Solutions
  - Eroding ditch outlets along the Red Lake River in Polk County were identified and mapped. The West Polk SWCD will use this information to plan grade stabilization projects that can be funded by the Clean Water Fund.
  - A culvert inventory and hydro-correction of LIDAR data will begin in July after that work is completed for the Thief River watershed.

### **Red Lake River and Grand Marais Creek Assessment (Surface Water Assessment Grant)**

- Project partners collected three rounds of samples for this project in June.
- After 2011, the three June samples taken within Judicial Ditch 30 had a geometric mean of 177 MPN/100 ml, which exceeded the 126 MPN/100 ml water quality standard. At least five E. coli samples are needed to assess the safety of water for aquatic recreation within a calendar month. A total of four June samples were collected in 2012. These samples bring the geometric mean for the month of June down to an acceptable 113 MPN/100 ml.
- The RLWD purchased two dipper samplers for sampling at the Grand Marais Creek monitoring site. The channel is too mucky too wide and flow is too shallow to use a Van Dorn sampler. A dipper sampler should allow someone to skim water from the channel without disturbing the sediment as much as the other methods. Marshall County staff will be using one of these dippers for this SWAG project.
- High E. coli concentrations occurred in June 2012 at the Sportsman's Bridge (Red Lake River near Red Lake Falls), Heartsville Coulee, Kripple Creek (twice), JD1, JD75, Black River (twice), Polk County Ditch 1 (twice), and Grand Marais Creek monitoring sites.
- The high E. coli concentration recorded at the Sportsman's Bridge is concerning because that site is located at the downstream end of a popular tubing route. So, the river is used quite a lot for recreation in that area and there is a lot of people that are being directly exposed to the water.
- There is no longer any flow in Polk County Ditch 1. In accordance with MPCA instructions, sampling will continue until the channel dries-up. There are still some pools of water in the channel that can be sampled.
- Minnesota Pollution Control Agency Biological Unit staff reported that they were threatened by Don Shirrick, a landowner in the Black River watershed. Therefore, the MPCA Commissioner ordered that all MPCA-funded sampling be halted at nearby sites due to the safety concern that resulted from those threats.

**Marshall County Ditch 20 Grade Stabilization Project (Grade Stabilization for Reduction of Sedimentation in the Thief River).**

- Meetings were held early in the month to discuss construction plans and the possibility of adding more side water inlets to the project.
- Construction started in late June.
- One of the grade stabilization structures was moved downstream. The original site in the plans happened to be adjacent to a landowner's yard and also on top of the site of a historical crossing of Silver Creek (a creek that used to flow to the Thief River in the lower part of the CD20 sub-watershed before the ditch was dug) and, later on, CD20.
- 14 side water inlets were installed by Friday June 29<sup>th</sup> (and the 15<sup>th</sup> was going in that day). As the photos show, some touch-up work and re-seeding was still needed. All of the work will likely be completed in July.
- Photos of two of the side water inlets installed along CD20:





- Bank stabilization



- Grade stabilization structure



### River Watch

Several schools conducted a round of River Watch monitoring in June with the assistance of Jim Blix and Alisha Mosloff:

- Thief River Falls
- Bagley
- Grygla
- Win-E-Mac

### Other Notes

- The Minnesota Department of Natural Resources hired Stephanie Klamm (a former RLWD employee) as the new DNR Hydrologist in the Thief River Falls office.
- RLWD staff provided new Pennington County SWCD staff with training on the calibration of their HACH 2100P turbidimeter.
- Sampling resumed in June for the Thief River Watershed Assessment Monitoring (Surface Water Assessment Grant) project.

### June 2012 Meetings and Events

- **June 4, 2012** - Pennington County Water Resources Advisory Committee Meeting
- **June 14, 2012** – Thief River Watershed Sedimentation and Buffer Initiative Information and Input Meeting – 9am – Grygla Community Center

### Future Meetings/Events

- **August 1, 2012** – BWSR CWF Grant semi-annual progress reports are due.
- **August 1, 2012** – MPCA Thief River Watershed Assessment Project semi-annual progress report is due.
- **January 31, 2013** – The second progress report or final report for the Thief River SWAG monitoring is due.
- **February 1, 2013** - BWSR CWF Grant semi-annual progress reports are due.
- **February 1, 2013** - MPCA Thief River Watershed Assessment Project semi-annual progress report is due.
- **June 30, 2013** – Expiration of the Thief River Watershed Assessment Project Contract.
- **June 30, 2013** – Expiration of the Red Lake River Watershed Assessment Project – Phase I Contract.
- **June 30, 2013** – Final report for the Thief River SWAG grant is due
- **July 30, 2013** – Due date for the final progress report and final invoice for the Thief River Watershed Assessment Project
- **July 31, 2013** – Final payment request for the Thief River SWAG is due.

**Plans for July 2012**

- Thief River Watershed Restoration and Protection Project.
  - Complete a semi-annual progress report.
  - James Blix and Alisha Mosloff will continue working on terrain analysis to identify potential erosion areas throughout the watershed.
  - Continuous water quality monitoring at five sites.
- Red Lake River Watershed Assessment Project
  - Complete a report on the existing data that is available for the watershed.
  - Complete a semi-annual progress report.
  - Create a webpage dedicated to the Red Lake River
  - Flow measurements (if there is rain and runoff) and continuous stage monitoring
  - Continuous dissolved oxygen at 6 sites. Deploy and retrieve sondes. Clean, calibrate, and download data from sondes.
  - Pre-9am dissolved oxygen (and other field measurements) at the “Smiley Bridge” crossing of the Red Lake River.
  - Schedule geomorphology work on Red Lake River sites.
  - Schedule a public meeting for the Red Lake River WRAP project.
  - Finish BEHI ratings and reconnaissance along the Red Lake River – downstream of Thief River Falls.
- Data compilation and entry for both Surface Water Assessment Grant Projects
- Finish the second round of sampling at long-term monitoring sites.

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

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