

**By: Corey Hanson, Water Quality Coordinator**

For: November 19th, 2007

RLWD Board Mtg.

**District Monitoring; Clearwater River Dissolved Oxygen and Fecal Coliform TMDL; Thief River Watershed Sediment Investigation; Project 60E Monitoring; Discharge from Fosston Lagoons; Red Lake River Erosion Assessment; Marshall County Groundwater Symposium**

**District Monitoring**

Another round of monitoring at RLWD long-term monitoring sites began in October. Results from the last round of monitoring (September 27) at the new Beltrami County monitoring sites once again show some high levels of E. coli bacteria. The E. coli concentrations at these Beltrami County sites were at acceptably low levels during the October round of sampling.

**Clearwater River Dissolved Oxygen and Fecal Coliform TMDL**

At the beginning of the month, water levels were very low in most streams in the Clearwater River watershed. With the rainfall in early October came increased water levels at most of these monitoring sites. The last 5 sets of E. coli samples for the 2007 TMDL study monitoring were collected during the month of October. Dissolved oxygen monitoring equipment was deployed through the month as well. Maintenance and data retrieval for this equipment continued on a bi-weekly basis.

Roger Fisher of the MPCA has developed a Quality Assurance Project Plan. I reviewed the document and submitted comments. A second invoice was sent to the MPCA for reimbursement of May and June expenses. The RLWD was paid \$2,735.41 after submittal of this invoice. Another invoice has been drafted for reimbursement of July – October expenses. A contract for SWAT modeling has been signed and is being reviewed by MPCA contract personnel.

<i>Standard = 126 MPN/100ml as a geometric mean of no less than 5 samples in a calendar month</i>						
	<b>Clearwater River</b>		<b>Lost River</b>		<b>Silver Creek</b>	
<b>Monitoring Site</b>	<b><u>780</u></b>	<b><u>37</u></b>	<b><u>782</u></b>	<b><u>51</u></b>	<b><u>81</u></b>	<b><u>157</u></b>
<b>Location</b>	Plummer USGS	CR96	Oklee USGS	CR7	CR11	1 mi W of Clearbrook
<b>Oct. '07 Geometric Mean E. coli (MPN/100 ml)</b>	61.4633	45.4379	21.5112	28.2843	46.1402	316.1795

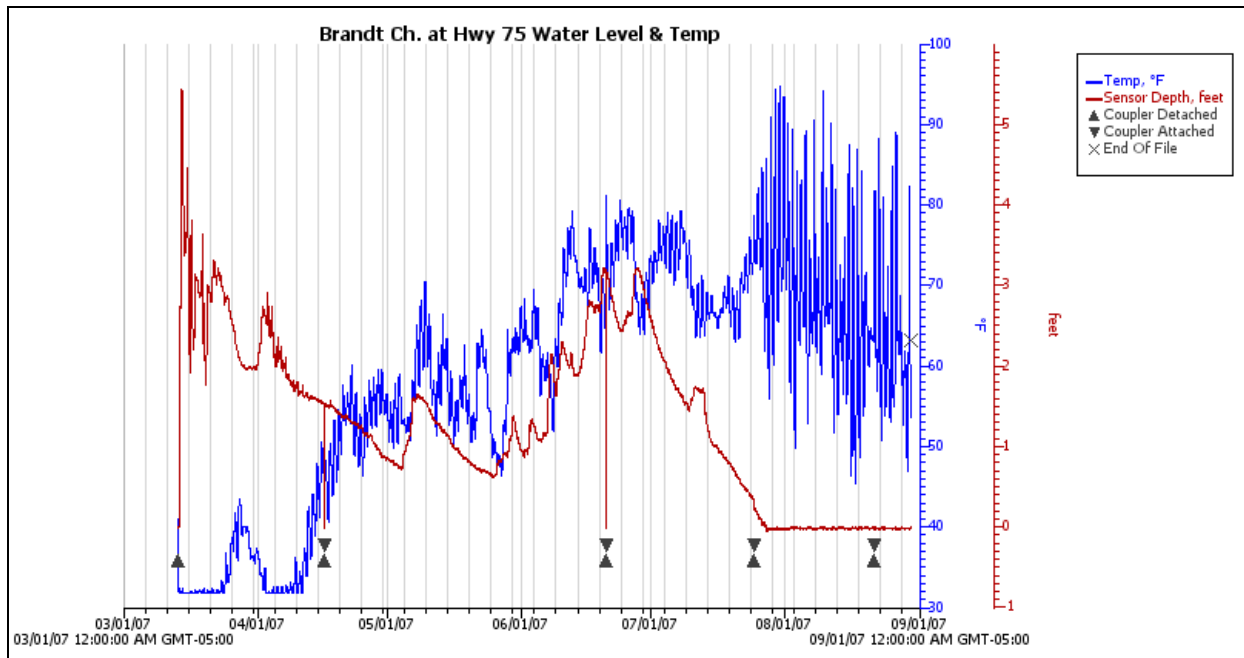
**Thief River Watershed Sediment Investigation**

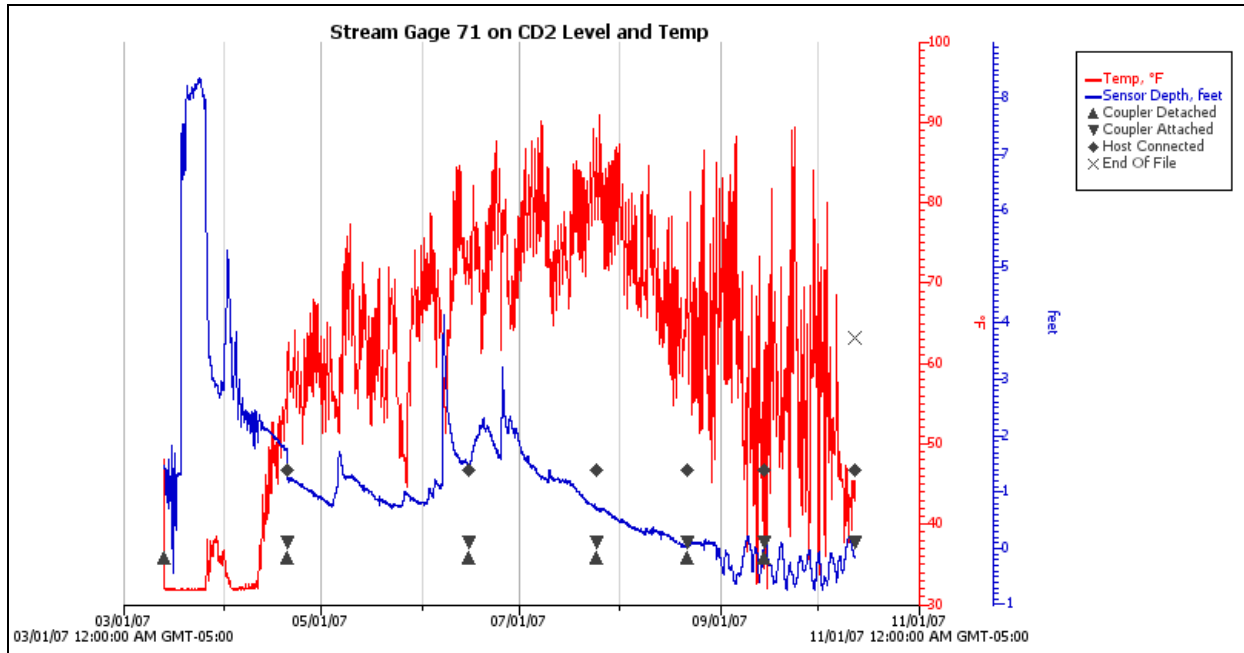
Samples were collected for this project in early October. The water had become quite clear with the cessation of flow. Flow and turbidity levels increased with the mid-October rain and releases of water from impoundments within the watershed. Maintenance of deployed monitoring equipment continued on a bi-weekly schedule. The Eureka Manta probes were deployed a final time (for the year) at the end of October.

The County Ditch 20 monitoring site went dry in early October, but began flowing in mid-October. I was unable to replace the Eureka Manta probe at this site due to a problem with its turbidity probe.

**Project 60E**

I checked on the equipment and made sure it was clean and ready, just in case there is enough rain to generate runoff. There was no flow in the Brandt channel or in CD 2.





### Erosion Assessment on the Red Lake River

One of the items on the to-do list for this summer was an inventory of erosion sites along the Red Lake River. This project was planned as part of the Red Lake River Corridor Enhancement Project. However, the Red Lake River Corridor Project has yet to be awarded any funding for the planned projects. So, it is up to the members of the RLRCE Joint Powers Group to accomplish what tasks they can. An assessment of erosion along the Red Lake River has increased in importance because of the current Turbidity TMDL Study that is being conducted by the MPCA on the Red River and many of its main tributaries (including the Red Lake River). Because we have no grant funding for the project, however, it is something that has to be “squeezed in” as time allows. The Red Lake River Rendezvous canoe trip offered a great opportunity to collect data (GPS points and Photos). The Northwest Regional Sustainable Development Partnership approved money to hire an intern that would help with the Thief River Watershed Sediment Investigation and an erosion assessment for the Red Lake River. She was only able to work on the Thief River Study until she traveled to Africa in June. After the trip to Africa, she worked for the DNR, out of Bemidji, banding ducks. Now that she is back in school at the University of Minnesota Crookston, she will have time to work on the erosion assessment part of her internship.

Upon ordering the necessary software (Garmin Trip and Waypoint Manager), I was able to upload onto a computer the GPS points that marked the locations of erosion site photos taken along the Red Lake River reaches between the Smiley Bridge and Thief River Falls and between the pre-Fisher Red Lake River Rendezvous Campsite and East Grand Forks.

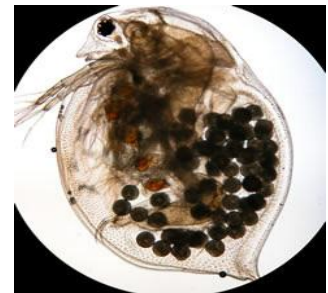
### Fosston Lagoons discharging

The Fosston River Watch group noticed that the water quality downstream of the Fosston lagoons had taken a major turn for the worse in mid-October. The water had a level of specific conductivity (related to dissolved solids) that was more than twice as high as normal readings at the site. The water was relatively turbid and teeming with “water mites.” The River Watch crew collected an *E. coli* sample at the POP20 monitoring site (downstream of the lagoons) on October 17<sup>th</sup>.



After Jim informed me of the problem, I visited both POP10 (upstream of lagoons) and POP20 (downstream of lagoons) on October 18<sup>th</sup>. I collected a more robust set of samples that will include analysis of total phosphorus, orthophosphorus, total suspended solids, *E. coli*, and biochemical oxygen demand.

The “water mites” were *Daphnia*. They are a common type of zooplankton (microscopic animals). They are commonly referred to as “water fleas” due to their twitchy movement through the water. Unlike actual fleas, *daphnia* are filter feeders, not parasites. Their abundance at POP20 is likely due to the abundance of their food source, phytoplankton (microscopic plants – algae), within the wastewater treatment ponds. The abundance of *daphnia* indicates that, although the Fosston WWTP is clearly negatively affecting the river, it’s at least not discharging any toxic chemicals. The River Watch and RLWD sampling should aid in the development of the TMDL Report for the dissolved oxygen impairment on the Poplar River.



### Other Notes

- Provided maps and data collected from the Red River Basin Buffer Initiative to the MPCA for use in the project’s final report and for use as a case study during the upcoming data assessment workshop.
- Discussed the progress of the Clearbrook Stormwater Study with Wade Robinson (Clearwater SWCD) and Jeff Hrubes (BWSR).
  - Wade has completed some of the P8 stormwater modeling to see which subwatershed of the city is contributing the most sediment and nutrients to Clear Brook. The two stormwater watersheds that were contributing the highest loads of sediment and nutrients were the subwatershed that includes the Wild Rice Processing facility and the subwatershed on the West side of town that enters Clearwater Brook near the auto body shop along Hwy 92.

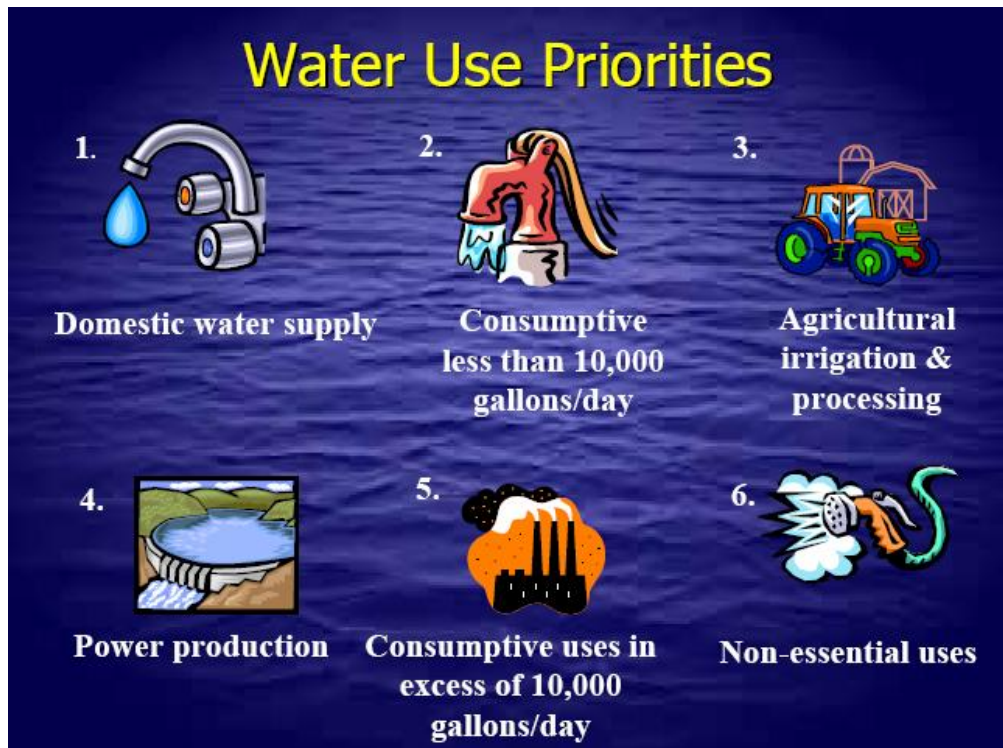
- We reviewed the data from RLWD sampling of stormwater outlets. The outlet along CR 5 collects water from the northwest side of town, including the wild rice facility and its large parking lot. This outlet had very high levels of sediment and nutrients when the samples were collected in the fall of 2004. Orthophosphorus (dissolved phosphorus) made up a large percentage of the total phosphorus concentration. This indicates that much of the phosphorus came from leaching through organic material, which likely occurred as rain fell upon wild rice that had been lain out to dry on the asphalt parking lot of the Wild Rice processing facility.
- Wade will use P8 to model the effectiveness of several different stormwater management methods within the problem stormsheds. When this step is completed, an engineer will develop plans for the most effective and feasible stormwater management option(s).

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### October Meetings and Events

- ❖ **October 4<sup>th</sup>** – TMDL List, public hearing, 1-4 PM, Detroit Lakes MPCA office.
  - Chose not to drive 4 hrs for a 2 hr. meeting, but still submitted comments, which led to further discussion about changes in dissolved oxygen data assessment methods.
  - There has also been some post-meeting discussion of the fecal coliform impairment on the Ruffy Brook to Lost River reach of the Clearwater River. Data collected through 2006 indicates that the reach is no longer impaired. The MPCA is, therefore, planning on delisting the reach. E. coli data collected for the Clearwater River Dissolved Oxygen and Fecal Coliform TMDL Study, on the other hand, shows that the channelized portion of this reach is indeed impaired by high levels of bacteria. The 2007 assessment only looked at data collected through 2006, but the 2007 data casts doubt upon the decision to delist.
- ❖ **October 10<sup>th</sup>** – Marshall County Groundwater Symposium
  - Groundwater 101 – Jim Lundy (Hydrogeologist)
    - GW Movement
      - High pressure to low pressure
      - Confining layers offer protection from surface activities
      - Wells without confining clay layers are considered sensitive, as they can allow contaminants from the surface to enter the GW
    - Nitrate probability ranking maps have been developed for Beltrami and Clearwater Counties
    - Wellhead Protection Areas manage land use around a water supply source
    - It is illegal to use dry wells for waste disposal
    - Marshall County has a 75% cost share program for well sealing, EQIP also provides \$ for sealing.
  - Marshall County Groundwater Studies – Don Hansen, USGS, St. Paul
    - *Availability and Quality of Water from Drift Aquifers in Marshall, Pennington, Polk, and Red Lake counties, NW Minnesota* – USGS WRIR 95-4201, by R.J. Lindgren
    - Delineated aquifers

- Basal confined aquifer is the primary water source (>400 ft – just above shale bedrock)
- NW MN has relatively low precip and high evapotranspiration compared to the rest of MN, which results in low recharge of aquifers (lowest in MN)
- Aquifers flow E to W
- Water Quality
  - Decreases down the gradient (increased dissolved solids)
  - Specific Conductivity decreases with depth
  - Unconfined aquifers are most susceptible to contamination
  - 2 of 23 samples were above the 10 mg/L nitrate standard
  - Low/non-existent pesticides in GW
- Water Supply and Ethanol Production by Bob Merrit (DNR)
  - Minnesota has Riparian Water Law - everyone gets a share
    - ND has Prior Right Water Law – whoever was first gets the most
  - Priorities under MN Law



- Ethanol
  - It takes 4-6 gallons of water to produce 1 gallon of ethanol
- Recommendations
  - Include water availability as a primary criteria for locating ethanol plants
  - Hire a water resources consultant early in the process
  - Early agency coordination
  - Employ water conservation strategies



▪ We WILL be going into another drought and we NEED to plan  
**October 18<sup>th</sup>** – Red Lake River Corridor Enhancement Project meeting, Thief River Falls City Hall, 6:30 PM

- Teleconference
  - November meeting is cancelled, but the December meeting remains scheduled
  - While they didn't have exact figures for this meeting, the raffle raised \$4,180. The group needed to raise enough money to pay for the \$2,500 birch bark canoe that was raffled, along with a few other RLR Rendezvous related expenses.
  - I reported on the erosion assessment and geocaches.
  - Because the LCMR funding will likely focus on bridges and flooding issues, it is not likely that there will be much money available for recreation projects. Therefore, we will have to continue to rely on the current capacities of the partner agencies and communities to accomplish the goals of the RLRCE project. The DNR, namely John Steward, has done a good job of placing priority on access-related projects along the Red Lake River.
  - There was not a quorum at this meeting, so members will vote on the payment of \$3,000 to the International Water Institute for the canoe and their assistance with coordination of the Red Lake River Rendezvous.
- ❖ **October 26<sup>th</sup>** – Red River Basin Monitoring Advisory Committee – All day meeting at the Sand Hill WD in Fertile
- Dealing with outliers in data analysis
    - Check with lab
    - Check for typos
    - Look at historical data
    - Comments/field notes
    - Look at other parameters
  - MPCA uses 20% as their standard in Relative Percent Difference data analysis
  - 2008 MPCA Monitoring Plans
    - Load/Condition Study duration. Will the study help determine the 10% reduction in phosphorus that Canada is demanding?
    - Rapid Geomorphic Assessments
      - How many streams?
      - Use RGAs to prioritize projects and the actions to be taken.
    - The Lake Bronson dam is old and they are looking for ideas regarding removal/replacement
    - There will be a new Bio-Monitoring unit at the Brainerd MPCA office that will monitor aquatic biology in northern Minnesota for condition, TMDL, and IBI development purposes
    - Jessica Poegel of the MPCA is working on fact sheets for each watershed in the RRB (MN side) that will describe the watersheds and summarize Red River Basin Monitoring Network water quality monitoring results.
    - DNR has money for additional stream gauging stations, including an acoustic Doppler station on Grand Marais Creek
- ❖ **October 29<sup>th</sup>** – Red River Basin Water Quality Team – Thief River Falls
- Snake R. Watershed Stream Survey Report - Tom Groshens (DNR)
    - Fish abundance low, especially in channelized segments

- Fish biomass lower in channelized segments
  - Game fish were only found in furthest downstream stations
  - 12/15 sampling sites had poor channel stability
    - Extensive ditching
    - Stream channelization
    - Lack of effective stream buffers
    - Land use practices
  - Red Lake Nation Nonpoint Source Plan – Shane Bowe
    - The Band plans to partner with off-reservation agencies for water quality projects.
    - Blackduck River is important to Sturgeon recovery project and walleye fishery, but is impacted by off-reservation land uses.
    - Pike Creek is also impacted by off-reservation land use (feedlot).
  - Judicial Ditch 66 Project – Phil Gerla
    - Restoration of a ditch that drains the gravel pit area on the Glacial Ridge property to reduce the amount of phosphorus discharged from the area.
      - Retrofit the ditch and restore the natural basin on its courses, and connect the channel to the flood plain using a two-stage ditch design with wetlands.
      - Enhance the hyporheic zone (the interface of ground water and surface water below the stream channel) and better understand the role of this zone in stabilizing nutrients.
      - Create natural vegetation buffer on the channel.
    - This ditch flows north and west to Kripple Creek, a tributary of the Red Lake River.
  - Rapid Watershed Assessments – John Beckwith (NRCS)
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### Future Meetings/Events

- ❖ **November 8<sup>th</sup>** – Meeting at Agassiz National Wildlife Refuge to discuss monitoring activities for the coming year.
  - Agassiz NWR has received funding to further augment the effort to study water quality issues within the refuge.
  - The USGS will be able to study sediment cores from deltas within Agassiz Pool.
- ❖ **November 8<sup>th</sup>** – 2pm – Teleconference with Carol Sinden and Molly MacGregor of the MPCA to review the delisting of the fecal coliform impairment on the Clearwater River and the relationship between E. coli and fecal coliform concentrations
- ❖ **November 15<sup>th</sup>** – EPA Region 5 TMDL Study Workshop
- ❖ **November 19<sup>th</sup>** – Red River Basin Water Quality Team – Moorhead
  - SWAT modeling for the Mustinka R. watershed, report of the buffer initiative, water quality trading, use of load duration curves for waters impaired by turbidity
- ❖ **November 30<sup>th</sup>** – Deadline for submitting data to the MPCA for entry into the EPA's STORET water quality database.
- ❖ **December 10<sup>th</sup>** – Red River Basin Data Analysis and Interpretation Workshop



- 9 am to 4 pm
  - EERC in Grand Forks, ND
  - ❖ **December 12<sup>th</sup>** – Marshall County WRAC
  - ❖ **December 14<sup>th</sup>** – Red River Basin Monitoring Advisory Committee – 9:30 to 2:30 – Sand Hill Watershed District
  - ❖ **December 20<sup>th</sup>** – Red Lake River Corridor Enhancement Project meeting, Fisher School Library, 6:30 PM
  - ❖ **January 17, 2008** – Red Lake River Corridor Enhancement Project meeting, Crookston City Hall, 6:30 PM
  - ❖ **January 31, 2008** – Final Report deadline for the Tile Drainage Study
  - ❖ **February 1, 2008** – Semi-annual report for the Thief River Watershed Sediment Investigation is due.
  - ❖ **February 14<sup>th</sup>** – Presentation at Tile Drainage Forum
  - ❖ **February 21, 2008** – Red Lake River Corridor Enhancement Project meeting, Red Lake Falls City Hall, 6:30 PM
  - ❖ **February 25<sup>th</sup>** – Red River Basin Water Quality Team Meeting
    - I will be giving a presentation on the results of the Tile Drainage Study
  - ❖ **March 20, 2008** – Red Lake River Corridor Enhancement Project meeting, St Hilaire City Hall, 6:30 PM
  - ❖ **April 17, 2008** – Red Lake River Corridor Enhancement Project meeting, Thief River Falls City Hall, 6:30 PM
  - ❖ **May 15, 2008** – Red Lake River Corridor Enhancement Project meeting, East Grand Forks – Campbell Library, 6:30 PM
  - ❖ **June 19, 2008** – Red Lake River Corridor Enhancement Project meeting, Fisher School Library, 6:30 PM
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