

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

**For: December 13th, 2007  
RLWD Board Mtg.**

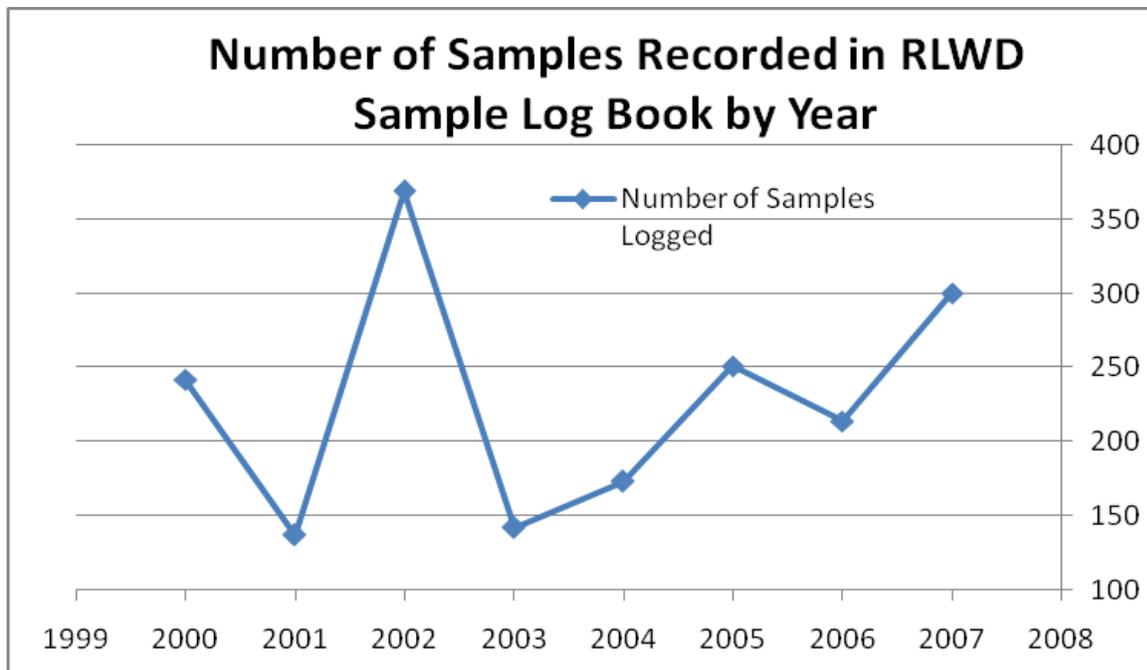
*District Monitoring  
Clearwater River DO and Fecal Coliform TMDL  
Thief River Watershed Sediment Investigation*



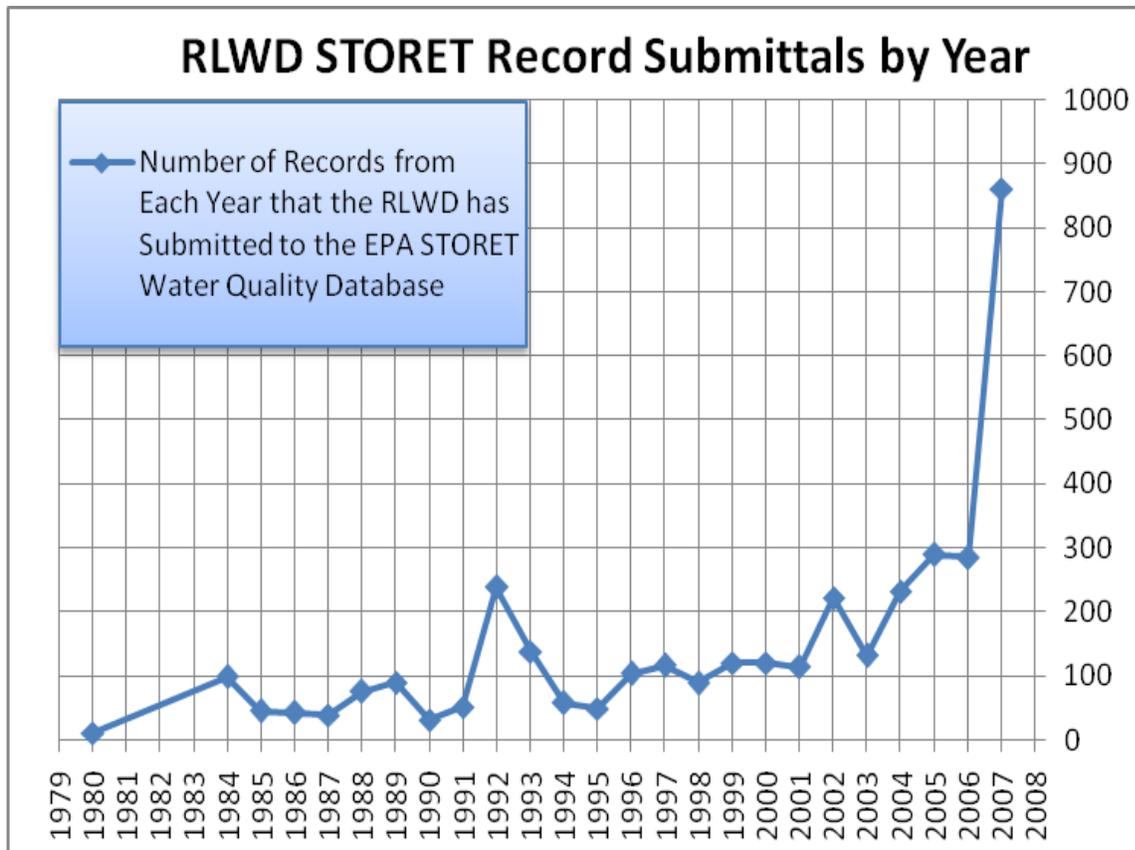
**District Monitoring**

Data from the 2007 sampling at the RLWD’s long-term monitoring sites have been entered into the RWLD Microsoft Access water quality database, imported to the MPCA’s STORET Microsoft Excel spreadsheet template, and submitted to the MPCA STORET entry staff. STORET is the EPA’s water quality database. The MPCA uses data in STORET for their statewide water quality assessments.

Each sample collected by the RLWD is recorded in a sample log book and is numbered. The purpose of this log is to keep track of the samples collected and to know when to collect duplicate and blank QA/QC samples (blanks and duplicates are collected for 10% of the samples the RLWD collects). More samples were collected and recorded in the RLWD sample log book than in any of the previous 4 years. The Thief River Watershed Sediment Investigation, Clearwater River Dissolved Oxygen and Fecal Coliform TMDL Study, increased efficiency, and long days helped me achieve this increase. The other higher points in the graph can be attributed to the Clearwater Lake Water Quality Model Study (2002) and supplemental fecal coliform sampling (2005).



Many sets of field measurements were also collected at sites that did not require sample analysis. The RLWD and other agencies/groups have the ability to collect data for many of the parameters used in water quality assessments (dissolved oxygen, turbidity, temperature, pH) while at the site and without needing to collect samples. The quantity of these field measurements that have been collected is evident in the number of records included in recent submittals of data for STORET entry. Of the 864 records submitted to STORET this year, 158 were from the RLWD long-term monitoring program (CWPREDLK STORET project code), 372 were collected for the Thief River Watershed Sediment Investigation (THIEFSED), and 334 were collected for the Clearwater River Dissolved Oxygen and Fecal Coliform TMDL Study (CLRWD OFC).



Some great monitoring partnerships have developed with other agencies for collecting data and cooperating with projects. The Marshall County Water Planner, Jan Kaspari, helped with the sampling for the Thief River study. Her efforts aren't reflected in the preceding graphs because she is able to enter her own data and submit it to STORET. United States Fish and Wildlife Service staff and student-workers collected a lot of field measurement data from within and around Agassiz National Wildlife Refuge this year. Of the 864 records that I submitted to STORET this year, 268 were collected by the USFWS. Meanwhile, the River Watch programs throughout the RLWD continue to collect data and get it submitted to STORET through the Red River Basin Monitoring Network.

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

- All of the data that was collected in 2007 for this project was entered into the RLWD Microsoft Access water quality database, queried into the MPCA's STORET Microsoft Excel spreadsheet template, and submitted to the MPCA STORET entry staff.
- All of the continuous monitoring equipment was removed from the rivers for the winter.
- The EERC plans to begin working on the SWAT model for the Clearwater River Watershed after Christmas. The EERC and the MPCA have a system worked out where the contractor (RLWD) will pass the subcontractor's (EERC's) invoices on to the MPCA and the MPCA will pay the EERC directly. So, this means that we won't be required to "front" the money for the modeling portion of the project. The SWAT modeling budget is \$50,000.
- A 3<sup>rd</sup> invoice was submitted to the MPCA for reimbursement of project costs totaling \$7,731.08.
- After data is retrieved from the Eureka Midge Dissolved Oxygen Loggers, they will need to be shipped to Eureka for maintenance, repairs (in some cases), and upgrades.
- The project work plan has been amended to incorporate RLWD address and MPCA staff changes.

**Thief River Watershed Sediment Investigation**

- A meeting was held at the Agassiz National Wildlife Refuge Headquarters to discuss next year's monitoring in and around the refuge. The refuge has received a couple
  - US Fish and Wildlife Service Environmental Contaminants (EC) Program – A Watershed Investigation of the Water Quality Entering and Leaving the Agassiz National Wildlife Refuge
    - \$281,450 Total Budget
      - \$46,000 for personnel – field
      - \$14,000 for personnel - data analysis
      - \$20,000 for personnel – report writing
      - \$3,100 for travel
      - \$9,000 for equipment and supplies
      - \$172,350 for a cooperative agreement with the USGS
      - \$17,000 for a cooperative agreement with the St. Croix Research Station
    - Install streamflow-gaging stations at three locations where flow enters the Refuge and three locations where flow leaves the Refuge.
      - We decided on using the existing sites, plus the stream gage #140 on the Thief River, stream gage #6 on branch 200 of JD11, and a new site at the newly constructed structure on the Thief River.
      - There was only enough money budgeted for one more water quality multiprobe. The consensus was that the money should be used to buy a profiling (spot measurement) multiprobe instead of a logging (deployed) multiprobe. The USFWS has been using the RLWD's old Hydrolab Datasonde 4a multiprobe, but it began to

have battery problems later in the year and a notice was recently distributed by HACH that they will be discontinuing maintenance on that particular model (but are offering a trade-in deal). Also, we felt that it would be important for the USFWS to use a Eureka Manta multiprobe for field measurements so the spot measurement data would be more comparable to the data collected from the deployed, logging Eureka Manta multiprobes.

- There will actually be 7 sites utilized for this study. The USGS can't afford to monitor the 7<sup>th</sup> site, which is stream gauge #6. This site is part of the RLWD's Thief River Study. So, there will be an exchange of services between the USGS and the RLWD where the USGS will take care of the 16 flow measurements at the stream gauge #140 site if the RLWD takes care of all the 16 flow measurements at site #6. This should result in less flow measurement work for the RLWD in the long-run, since at least 10 measurements at each site would have been needed anyway to create rating curves for the Thief River Watershed Sediment Investigation. There will, however, have to be an effort made to coordinate sampling efforts with the USGS and collect sufficient measurements at different levels of flow within a two year period.
  - Collect sixteen (8/yr) discharge measurements at each gaging station to develop a stage-discharge relationship
  - Collect sixteen (8/yr) width and depth integrated samples for suspended sediment and nutrient analyses at each gaging station
  - Operate four continuous water quality sondes to aid in development of a relationship between streamflow and water quality
  - Collect daily dip samples at the two gaging stations for which there are no continuous water quality sondes and analyze for specific conductivity and turbidity
    - The USFWS plans to hire a seasonal employee for the project
  - Compute daily streamflow at each gaging station
  - Develop relationship between streamflow and turbidity measurements at the gages and suspended sediment, total phosphorus, and ammonia plus organic nitrogen concentration at each station
  - Take one sediment core sample at two deltas within Agassiz pool and analyze to determine the rate and content of sediment deposition for the last 200 years
- USGS-Funded Science Support Project (SSP) – Investigation of water Quality Conditions at Agassiz National Wildlife Refuge
  - \$61,670 budget
  - Primary Objectives
    - Identify the true sources of water quality problems by quantifying turbidity, dissolved oxygen levels, nutrients, and ammonia flowing into and out of Agassiz NWR
    - Determine sedimentation rate and content within Agassiz Pool since Refuge establishment and European settlement

- Use the above information to quantify the extent of Refuge contribution to the impairments in question
  - Secondary Objectives
    - Determine an appropriate hydrologic and water quality sampling scheme for subsequent years of monitoring at Agassiz NWR
    - Provide managers of similar wetland systems/complexes at other NWRs with data related to identification of water quality issues, as well as guidance on monitoring strategies that may be effective for their particular wetland(s)
  - SSP results will be used in the EC project report
- Ditch 11 (downstream of the Agassiz Pool outlet's radial gates) will be shut down next year for repairs
  - The new structure on the Thief River will pass-through flow from the Thief River/SD83
  - In the future, the new structure will also allow bypass of late releases from Moose River Impoundment and Thief Lake. The new structure is not subject to freezing open/shut like the radial gate outlet.
- Data from the 2007 sampling at the Thief River Watershed Sediment Investigation monitoring sites have been entered into the RWLD Microsoft Access water quality database, queried into the MPCA's STORET Microsoft Excel spreadsheet template, and submitted to the MPCA STORET entry staff.
- Continuous water quality and stage monitoring equipment was retrieved from the project's monitoring sites for over-winter storage and maintenance.
- Provided the Marshall County Water Planner, Jan Kaspari with a template for keeping track of expenses and submitting invoices for reimbursement. Because Jan, with assistance from Lisa Newton of the Marshall-Beltrami SWCD, is collecting monthly samples at 7 of the 11 monitoring sites for this project, we are sharing the grant with her by reimbursing 50% of her staff time and expenses. The other 50% of her expenditures will be used as in-kind and cash matching expenditures in grant reporting.

### Other Notes

- Project 60E continuous stage and turbidity monitoring equipment was retrieved from the Brandt channel and County Ditch 2 monitoring sites.
- The Red Lake County and Pennington county water planners talked to me about their Clean Water Legacy Act Surface Water Assessment grant applications that they submitted. Pennington County hopes to monitor water quality along the JD30/18/13 system and on a ditch south of town such as CD62. Red Lake County plans to add sites on CD57 and Cyr Creek while also increasing monitor efforts at other sites.
- The West Polk SWCD received a call regarding a milky substance in Branch 1 of CD 158 which runs parallel to the north side of US Highway 2 in Section 31 of Gentilly Twp. This is only about 1 mile upstream of where the ditch enters the Red Lake River. The purported source of the contamination was a gravel pit that was discharging water. The SWCD passed along a report of the incident to MPCA and DNR regulatory staff.



### November Meetings and Events

- ❖ **November 1<sup>st</sup>** - Jury Duty
- ❖ **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
  - In theory, E.coli concentration is a subset of the concentration of fecal coliform within a sample. The MPCA has approved a standard for E.coli of 126 MPN/100ml that is supposed to have the same level of protection as the 200 CFU/100ml standard for fecal coliform. In the lab analysis results for RLWD paired E.coli and fecal coliform samples, however, E.coli concentrations are often higher than fecal coliform concentrations. This was met by some of the MPCA

staff with some disbelief. The unexpected relationship between the two bacteria indicator tests can be attributed to the difference in test methods.

- The E.coli quanti-tray method accommodates the full 100 ml sample without interference from suspended solids.
  - The fecal coliform analysis includes filtration, which can damage organisms.
  - Because of the filtration, the fecal coliform samples often have to be diluted, especially in samples with high concentrations of suspended solids.
  - The dilution can exaggerate the variability that is inherent in bacteria indicators, particularly at low levels of bacteria.
  - The E. coli standard will replace the fecal coliform standard because it is a better test and indicator of the risk of gastroenteritis. Because of the difference between the E. coli and fecal coliform bacteria tests, however, the new E. coli will, in reality, be more stringent than the old fecal coliform standard.
  - We discussed whether or not to delist the fecal coliform impairment Ruffy Brook to Lost River reach of the Clearwater River. Fecal coliform data from the most recent 10 years indicates that the river is not impaired for that parameter. Recent E.coli monitoring indicates the possibility of E. coli impairment on the river. Because of this, the MPCA decided not to delist the reach at this time.
  - Also discussed were the MPCA's assessment methods.
    - Bacteria requirements will continue to allow aggregation over the most recent ten years and won't be increased, as rumored, to require 5 samples from each month in each year.
    - The MPCA's assessment methods state that dissolved oxygen "measurements should be made before 9:00 am in order to measure the lowest diurnal DO concentration." This was cause for concern because it could potentially mean that most of the data collected by monitoring programs might not be used in assessments. In clarification, the MPCA staff said that the guidance "strongly recommends, but does not require that dissolved oxygen measurements be made before 9:00 am." The time of day that measurements are taken will still be taken into account during assessments.
- ❖ **November 15<sup>th</sup>** – EPA Region 5 TMDL Study Workshop
- The training session covered, in detail, what the EPA expects to see in each section of a TMDL report (loading capacity, loading allocations, etc). It was important for me to attend because I will be responsible for writing the TMDL Report for the Clearwater River Dissolved Oxygen and Fecal Coliform TMDL Study.
- ❖ **November 30<sup>th</sup>** – Deadline for submitting data to the MPCA for entry into the EPA's STORET water quality database.

**Future Meetings/Events**

- ❖ **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** – Judging at the Franklin Middle School Science Fair, 12-3 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