

By: Corey Hanson, Water Quality Coordinator
For: January 14, 2010
Red Lake Watershed District Board Meeting

Thief River Watershed Sediment Investigation

- Worked on providing Houston Engineering with data to aid in the calibration and development of the SWAT model.
 - In order to get an approximation of the amount of tile in the sub-basins of the Thief River watershed, I did a windshield survey of tiled fields (looked for pumped outlets). I GPS'd the fields that had tile. Based on the percentage of acreage in tile versus the total acreage of fields that I drove by, I was able to provide HEI with percentages, by sub-basin, of farmed land that is in tile.
 - With Loren's help, I was able to provide HEI with discharge data from the Moose River pools. Stephanie Johnson of HEI was also able to get discharge data from Thief Lake and Agassiz NWR.
- Put together a draft work plan for the upcoming watershed-based TMDL Study
 - Met with MPCA staff in Detroit Lakes to go over the work plan.
 - Talked to Dave Friedl about the stream channel stability work that will take place this summer.
 - Tasks:
 1. Evaluation of existing data
 2. Water quality sampling
 3. Continuous monitoring
 4. Biological data collection and analysis
 5. Stage and flow monitoring
 6. Stream channel stability assessment
 7. Stressor identification
 8. BASINS model development
 9. Monitoring data entry
 10. Monitoring data analysis
 11. Civic engagement
 12. Identification of sources and solutions
 13. Final report and semi-annual reporting
- Retrieved the remaining HOBO water level loggers from TRWSI monitoring sites.
- Completed a data review of the 2009 STORET submittal from this project.

Other Notes

I talked to John Cucci of the Clearwater Lake Area Association about water quality sampling for Clearwater Lake in coming years. I let him know that the RLWD would be able to pay for the analysis as part of the regular district monitoring program, especially if there are trained volunteers ready and willing to collect the samples. Some coordination will be needed to get the samples shipped. The Clearwater SWCD will be monitoring other lakes in the area and can pick up samples for delivery to RMB labs along with their samples from other lakes.

The Lost River (Anderson Lake to Hill River) E. coli impairment and the Clearwater River (Ruffy Brook to Lost River) E. coli impairment were officially delisted (removed from the draft 2010 List of Impaired Waters) on December 28th. The Clearwater River (Ruffy Brook to Lost River) low dissolved oxygen impairment will likely be delisted after the continuous monitoring data is reviewed by the MPCA.

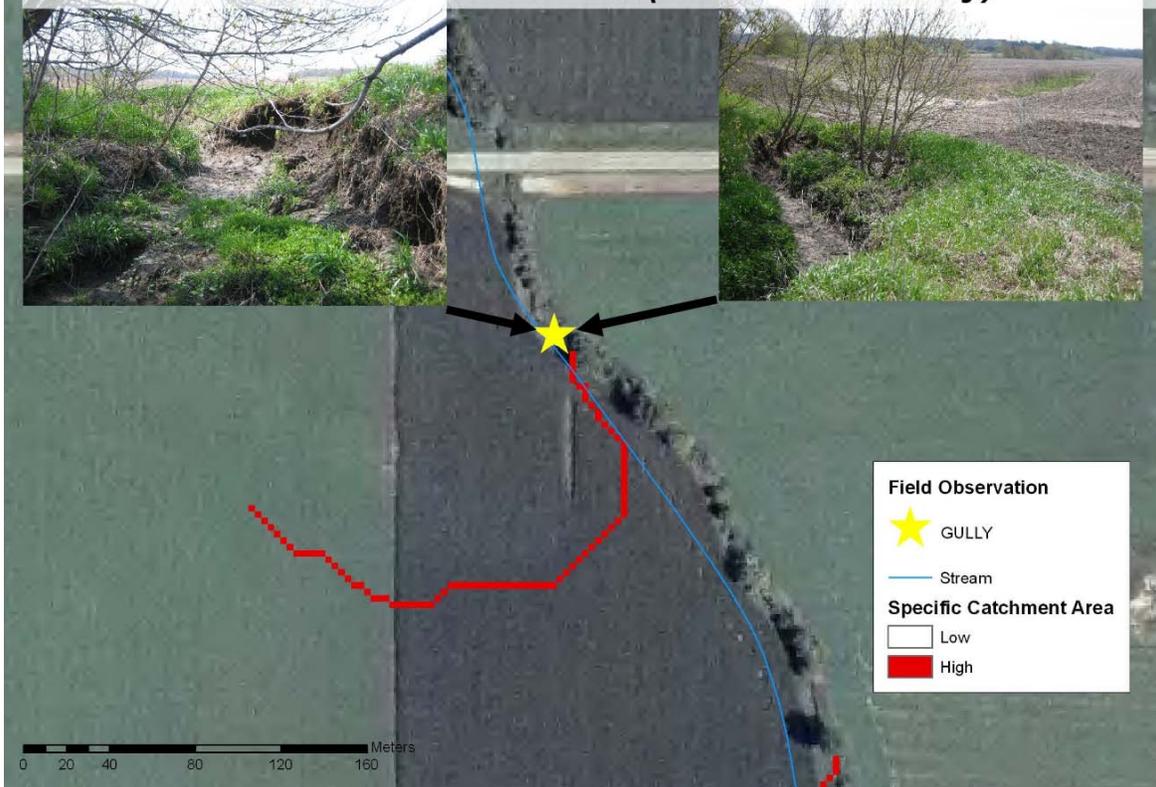
I researched and ordered computers to replace Tammy's desktop (from Dell.com) and the RLWD's Dell laptop that is used for meetings (Dell from Wal-Mart).

December Meetings and Events

- **December 3, 2009** – Minnesota Drainage & Water Management MAWD Pre-Conference Session
 - I gave a presentation at the MAWD drainage conference about the tile drainage study
 - “Modeling the Effects of Conventional, Shallow, and Controlled Subsurface Drainage,” by Gary Sands
 - The highest density of tile drainage in Minnesota is in the south-central part of the state.
 - Nutrient loss strategies fall under the basic categories of “avoiding,” “controlling,” and “trapping.”
 - Shallower tile reduces nitrate losses by about 20% (1 foot shallower). Shallow and controlled drainage reduce the total volume of water that leaves the field.
 - Controlled and shallow drainage systems need to be spaced closer, or there will be a relative reduction in yields compared to tile installed at a standard depth.
 - Yield curves fatten off (plateau) as spacing gets closer = diminishing return on spacing.
 - All types of tile drainage systems have less nitrogen losses at a wider spacing. The key is finding a compromise/incentive, perhaps at the point at which we can get the biggest decrease in nitrates for a minimal reduction of the gain in yields from installing tile.
 - “Terrain Analysis and Identification of Concentrated Flow Inlets to Drainage Ditches” by Adam Birr.
 - Precision conservation
 - Critical areas are defined by:
 - Accumulation of runoff
 - That accumulation of runoff is connected to a surface waterbody.
 - Use a digital elevation model (DEM) to ID flow accumulation points (each pixel has a pour point). Existing DEMs are good enough for areas with plenty of topography. LIDAR would be needed to do this analysis in the Red River Basin. Fortunately, LIDAR will be available soon for our area.
 - Stream Power Index is calculated (intersection of slope and drainage area)

- SPI represents areas that are erosive.
- Field surveys were conducted to check the results of the terrain analysis. Staff walked ditches and documented all near-stream features with GPS, drain attributes, etc.
- Field verified gullies coincided with flow accumulation pathways and sites with high stream power index values.
- Just the areas with high SPI intensity corresponded with the field-verified sites.
- TMDL implementation plan potential
- Probable erosion problem sites can be identified by filtering the SPI data to include just the locations in the top 15% of SPI values.

Example: Using Specific Catchment Area to Identify Gullies *Belle Creek Watershed (Goodhue County)*



- **December 11, 2009** – Red River Basin Monitoring Advisory Committee, 9:30, Fertile
 - The annual spring water quality training session will be held again this year. We discussed having two days of training; one for the northern basin and one for the southern basin. The training will take place in the first week of March.
- **December 15, 2009** – Clearwater County Water Plan Task Force
- **December 16, 2009** – Conference call about the Clearwater TMDLs with St. Paul MPCA and DL MPCA staff.

- Proceed with delisting of the Lost River (Anderson Lake to Hill River) E. coli, Clearwater River (Ruffy Brook to Lost River) E. coli, and Clearwater River (Ruffy Brook to Lost River) low dissolved oxygen impairments.
- Address the EPA's comments on the Silver Creek E. coli and Poplar River low dissolved oxygen TMDLs. Have new preliminary drafts ready by April 1st, 2010. The EPA comment period will be then be 30 days. When we get comments back from the EPA again, we should be able to have a draft ready for public comment on review sometime in June. The target approval date is September 30th, 2010. The MPCA will "sit" on the CD57 and Walker Brook TMDLs until the tiered aquatic life use standards are developed. After the two TMDLs are approved, then we can work on protection plans for the reaches that are being delisted as a result of the Clearwater River Dissolved Oxygen and Fecal Coliform TMDL Study.

Plans for January 2010

- Analyze sampling data for the Thief River Watershed Sediment Investigation.
- Work on continuous data records from the TRWSI.
- Format continuous data records for HYDSTRA.
- Complete the revision of the Draft Silver Creek E. coli TMDL.
- Begin working on revising the Draft Poplar River Dissolved Oxygen TMDL
- Download and print flow measurement data from the AquaCalc 5000.
- Print 2009 flow records for the stream gauge files
- Finish data reviews for 2009 STORET submittals.
- Write 2009 Annual Report articles.

Future Meetings/Events

- **January 14th, 2010** – Franklin Middle School Science Fair judging, 12 PM – 3 PM.
- **January 15th, 2010** – Completed work plan for the Thief River watershed-based TMDL
- **January 20th, 2010** – Marshall County Water Resources Advisory Committee, 9:30, Newfolden.
- **January 21st, 2010** – Thief River Watershed Sediment Investigation Informational Meeting, 9am, RLWD Meeting Room
 - Introduction to the project
 - Resource condition
 - Summary of Thief River Watershed water quality projects
 - SWAT modeling goals and objectives, processes modeled, limitations, expected output)
 - Scenarios to model
- **February 1, 2010** – The semi-annual report for the Thief River Watershed Sediment Investigation is due.
- **February 1, 2010** - Pennington County Water Resources Advisory Committee, 9 AM
- **First week of March 2010** – Annual Spring Water Quality Monitoring Training Session.
 - I will be presenting on two topics: Planning a Monitoring Effort, and Standard Operating Procedures.