

By: Corey Hanson, Water Quality Coordinator
 For: January 12, 2011
 Red Lake Watershed District Board Meeting

Thief River Watershed Assessment Project (Watershed-Based TMDL)

- Task 1 – Evaluation of Existing Data
 - Rochelle Nustad of the United States Geological Survey provided continuous flow, continuous water quality, discrete water quality sample, and discrete flow measurement data for the Thief River monitoring site at the Agassiz National Wildlife Refuge North Boundary Road that was collected from 2008 through 2010 for the Agassiz National Wildlife Refuge Water Quality Study.
 - Started working on an “Evaluation of Existing Data” report for the Thief River watershed. That report will include an assessment of water quality conditions within each subwatershed (HUC10) using existing data.
 - Houston Engineering needed to know what data is available for use in the calibration of the HSPF model. So, I put together a summary table that shows what type of monitoring (and when) has been done throughout the Thief River watershed:

Site Name	760	156	2	40	140	98	15	MR300	X4	JD21	757	6	41	JD30	
EQuls Code	S002-079	S004-495	S004-052	S002-088	S004-055	S002-084	S002-089	S006-539	S004-211	S006-540	S002-078	S004-493	S004-494	S004-965	
River/Ditch Name	Thief River	Thief River	Thief River	Thief River	Thief River	Thief River	Moose River	Moose River	Moose River	Branch A, JD21	Mud River	Branch 200, JD11	Marshall CD20	Judicial Ditch 30	
Road Crossing	140th Ave	CSAH 44	CSAH 12	CR7	380th St. NE	CSAH 49	Hwy 89	300th Ave NE	Hwy 54	CSAH 48	Hwy 89	190th Ave NE	180th Ave NE	140th Ave	
Existing Flow Data	USGS Flow Website														
	2007-09 Flow Website		TRWSI	TRWSI	TRWSI	TRWSI	TRWSI		TRWSI		TRWSI	TRWSI	TRWSI		
	2010 Flow Website				RLWD	USGS	RLWD		RLWD	RLWD		RLWD	RLWD	RLWD	
	2011 Flow Website				RLWD for MWRPP	RLWD for MWRPP			RLWD for MWRPP	RLWD for MWRPP	RLWD for MWRPP	RLWD for MWRPP	RLWD for MWRPP	RLWD for MWRPP	
Existing Water Quality Data	>20 yrs. Of RLWD 4X/Yr. Sampling	RLWD			RLWD		RLWD	RLWD			RLWD				
	2010-2011 RLWD 4X Sampling	RLWD			RLWD	RLWD	RLWD	RLWD		RLWD		RLWD	RLWD	RLWD	
	2007-09 Cont. WQ	TRWSI			TRWSI	TRWSI					TRWSI	TRWSI	TRWSI		
	2007-09 Monthly Samples	RLWD	RLWD	RLWD	Marshall Co.	USGS	Marshall Co.	Marshall Co.		Marshall Co.		Marshall Co.	Marshall Co.	RLWD	
	2011 SWAG	Penn. Co.			Marshall Co.	Marshall Co.			Marshall Co.			Marshall Co.	Marshall Co.	Penn. Co.	Penn. Co.
	2011 Cont. WQ	RLWD for MWRPP			RLWD for MWRPP	RLWD for MWRPP							RLWD for MWRPP	RLWD for MWRPP	
	2008-09 SWAG														Penn. Co.
2001-2003 Marshall CWP				Marshall Co.		Marshall Co.	Marshall Co.		Marshall Co.		Marshall Co.			Marshall Co.	
2003-11 Event-Based Sampling	MPCA, IWI, RRWMB														

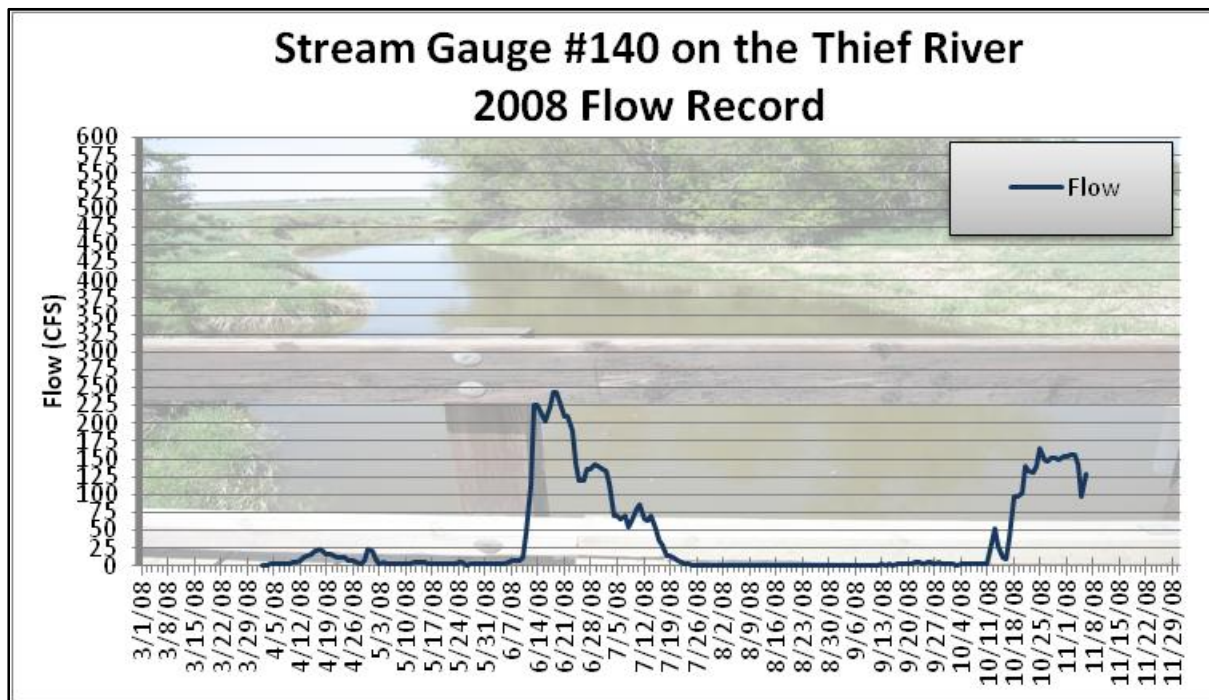
- Task 3 – Continuous Water Quality Monitoring
 - 2011 data was compiled and corrected under Task 10
 - Purchased batteries for next year’s monitoring.
- Task 5 – Stage and Flow Monitoring
 - 2011 data was compiled and plotted under Task 10

- Task 6 – Stream Channel Stability Assessment
 - Dave Friedl plans to have a summary of the results completed in April 2012.
 - Dave will also be giving a presentation at the Thief River Watershed Assessment Project Kick-Off Meeting on January 13th, 2012 about the geomorphology work that was done this summer.

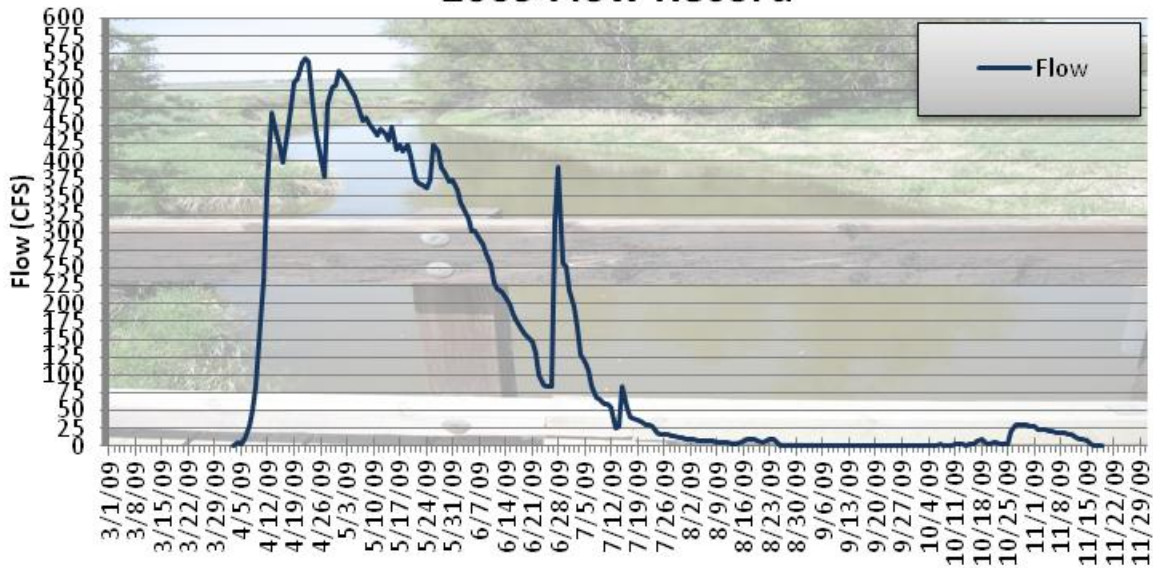
- Task 8 – Watershed Modeling
 - Discussed the Thief River HSPF model with Stephanie Johnson and Tim Erickson of Houston Engineering.
 - Provided flow and water quality data to Houston Engineering for calibration of the HSPF model.

- Task 9 – Monitoring Data Entry
 - Prepared and submitted a set of data that was collected for the TMDL and SWAG projects during the State shutdown using RLWD funds.

- Task 10 – Data Analysis
 - Compiled and plotted the 2008- 2010 (USGS) and 2011 (RLWD) flow records for site #140 on the Thief River (Agassiz North Boundary Road, S004-055). In addition to the 2008 through 2010 flow data, the USGS also provided the flow measurement results that I needed in order to create a flow rating curve for the site.

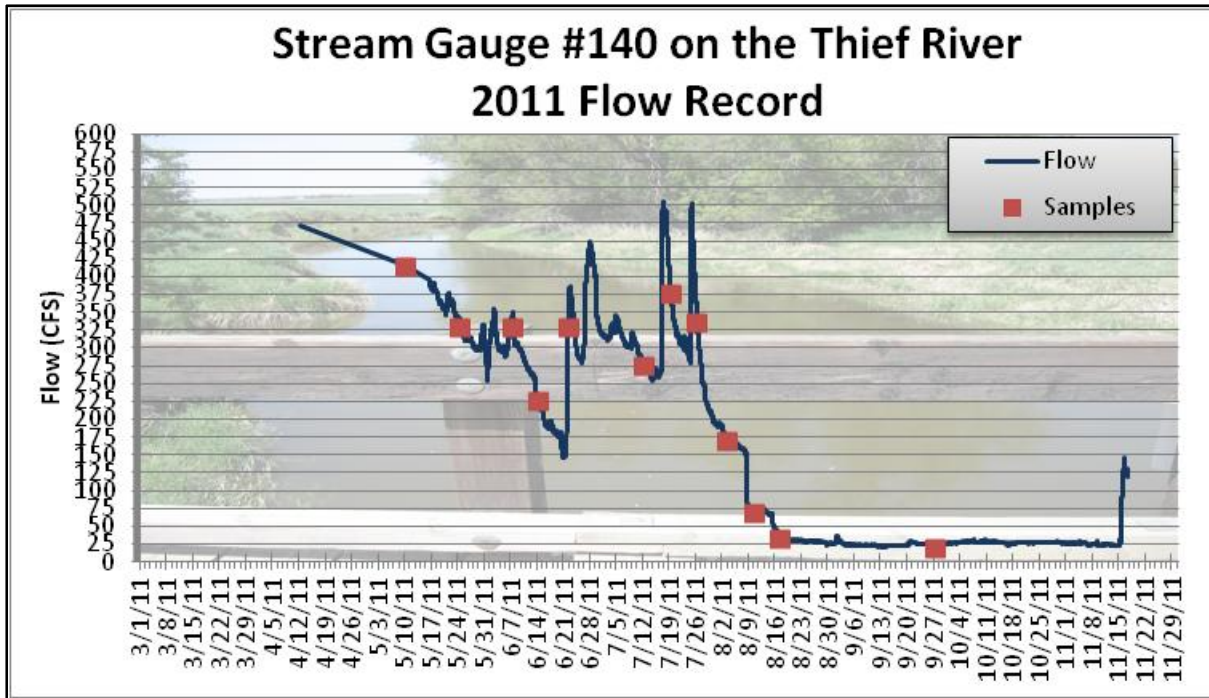


Stream Gauge #140 on the Thief River
2009 Flow Record

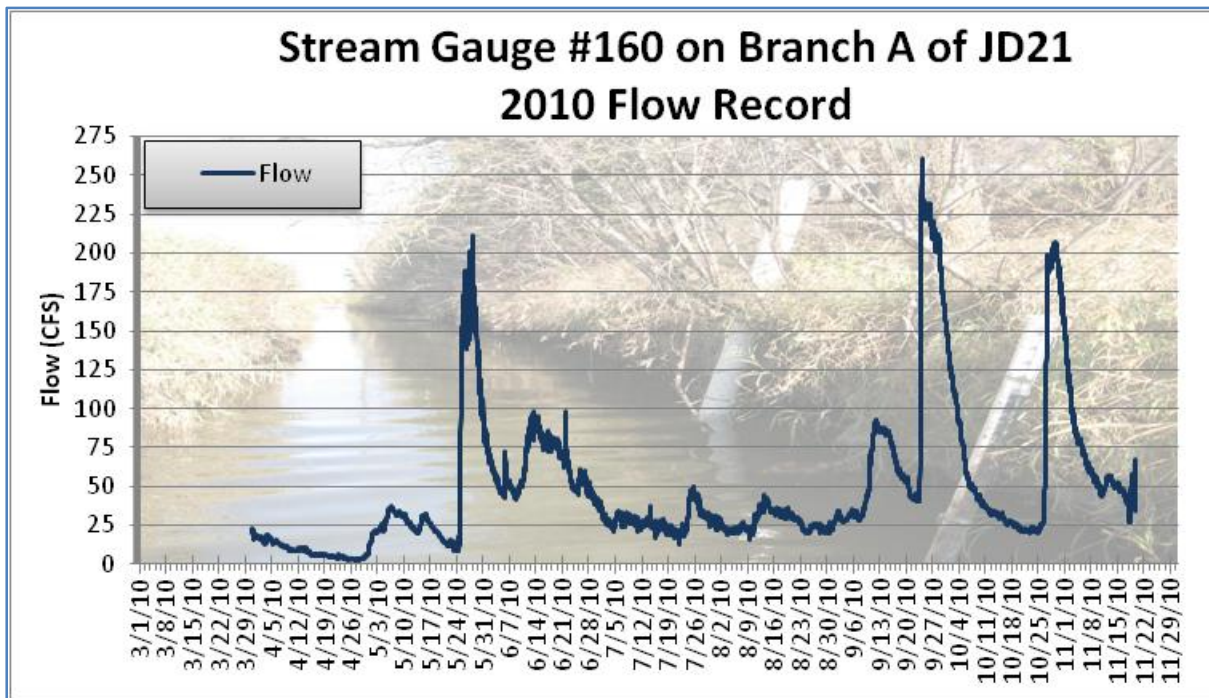


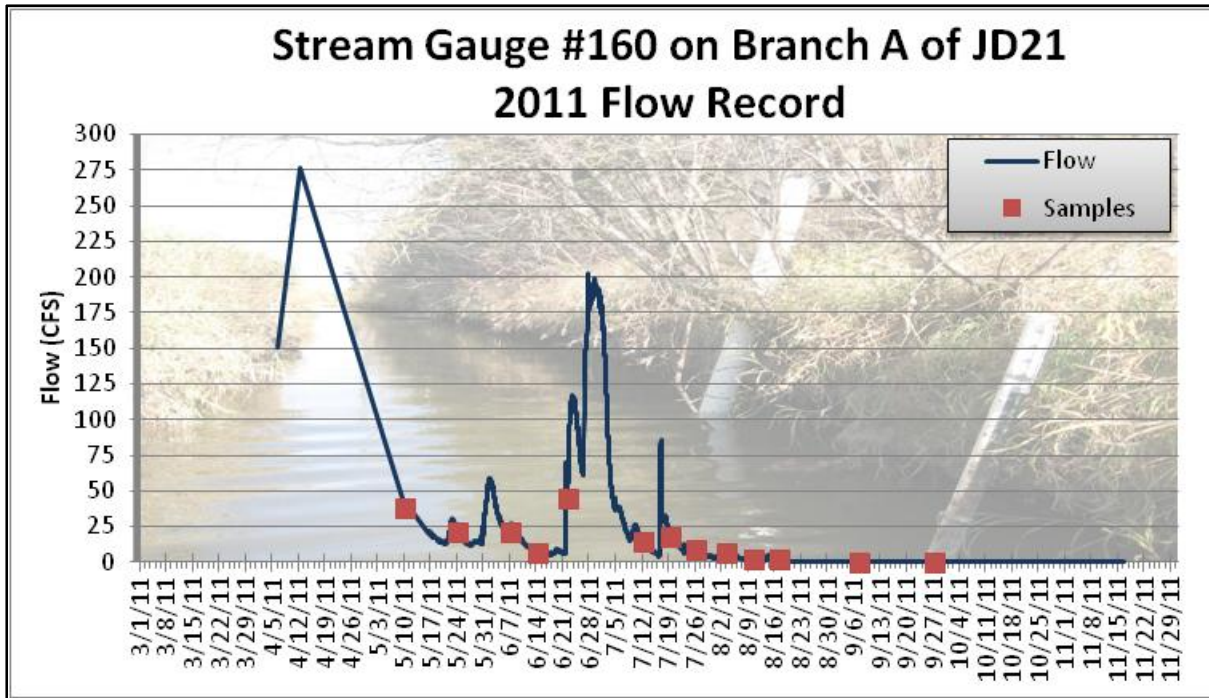
Stream Gauge #140 on the Thief River
2010 Flow Record



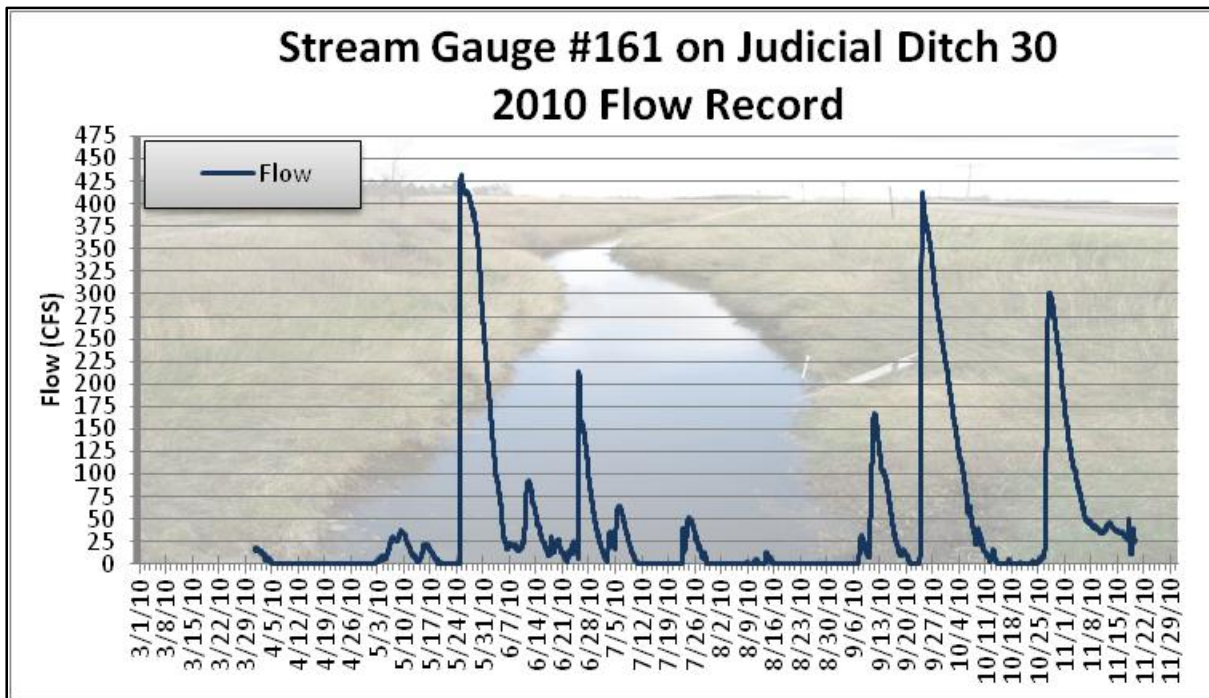


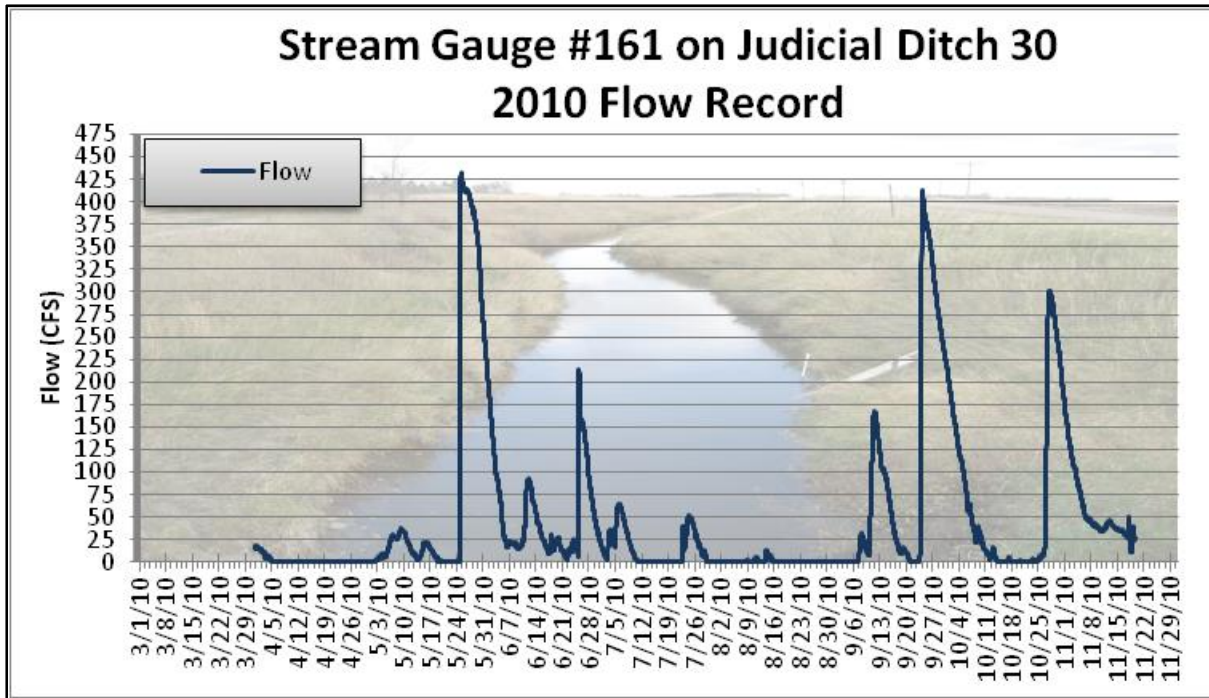
- Compiled and plotted the 2010 and 2011 flow records for site #160 on Branch A of JD21 at County Road 48 (S006-540).



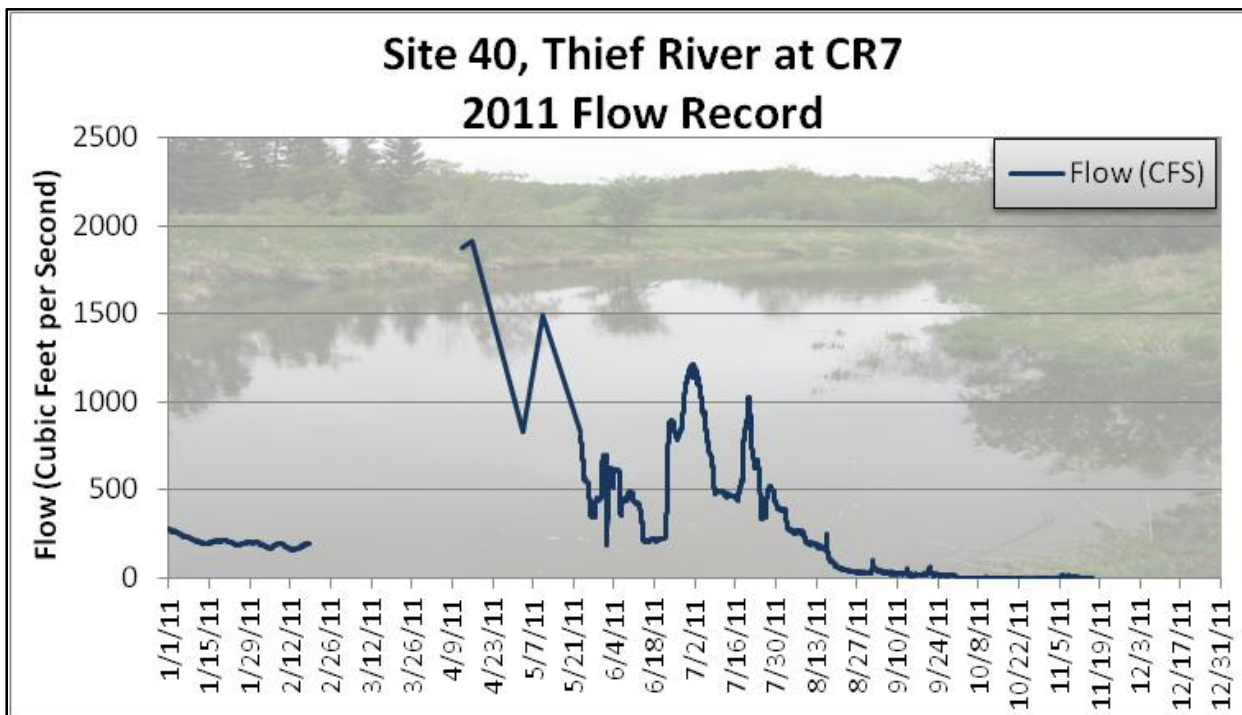


- Compiled and plotted the 2010 and 2011 flow records for site #161 on Judicial Ditch 30 (S004-966).

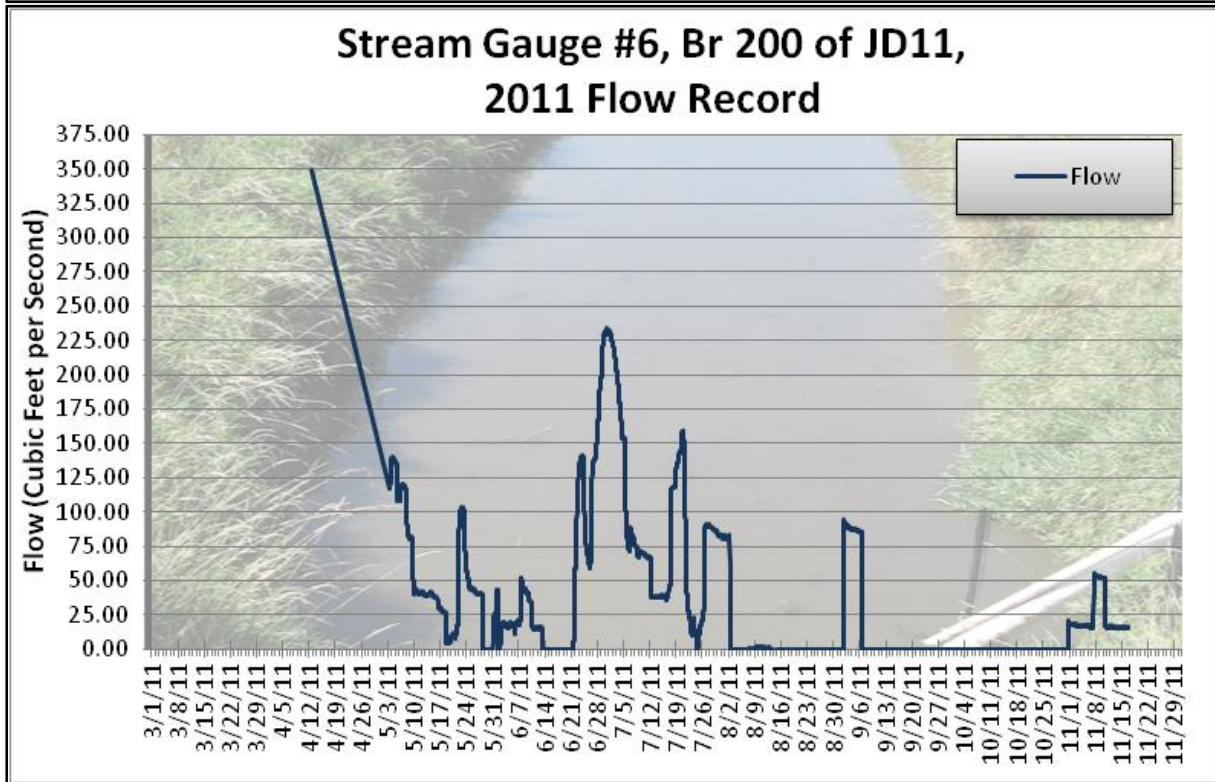
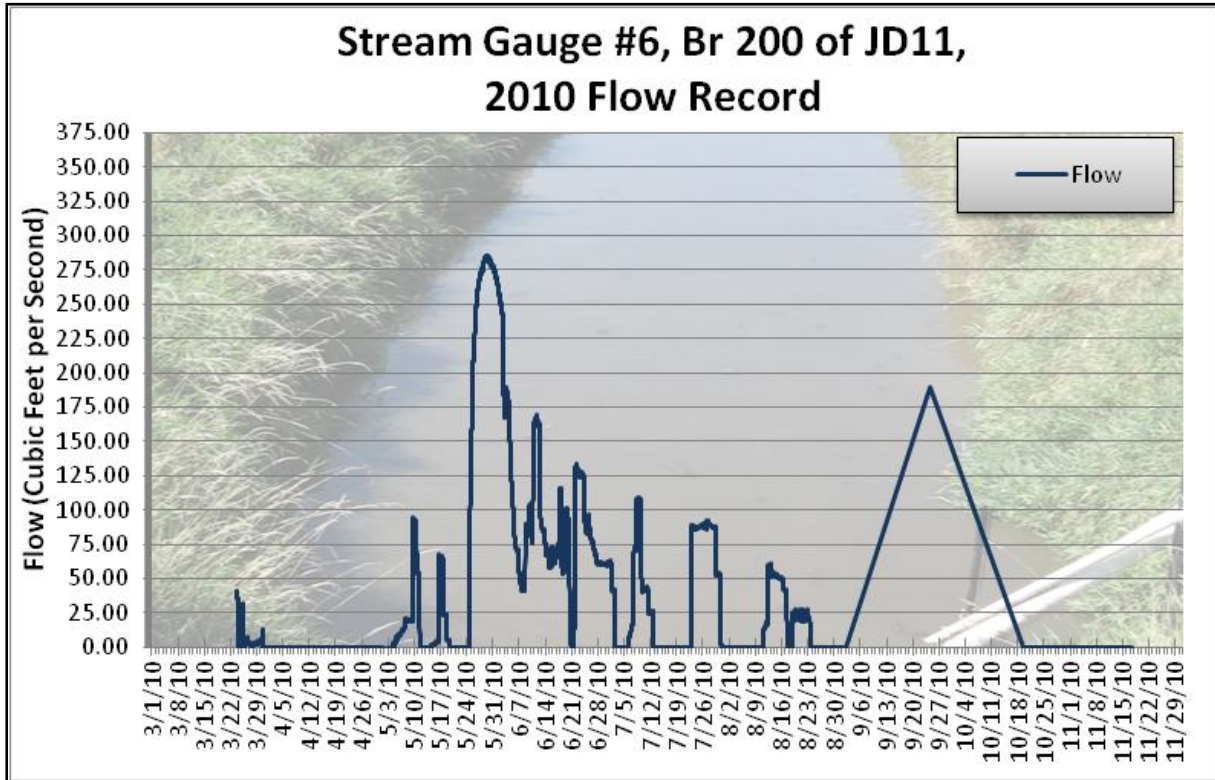




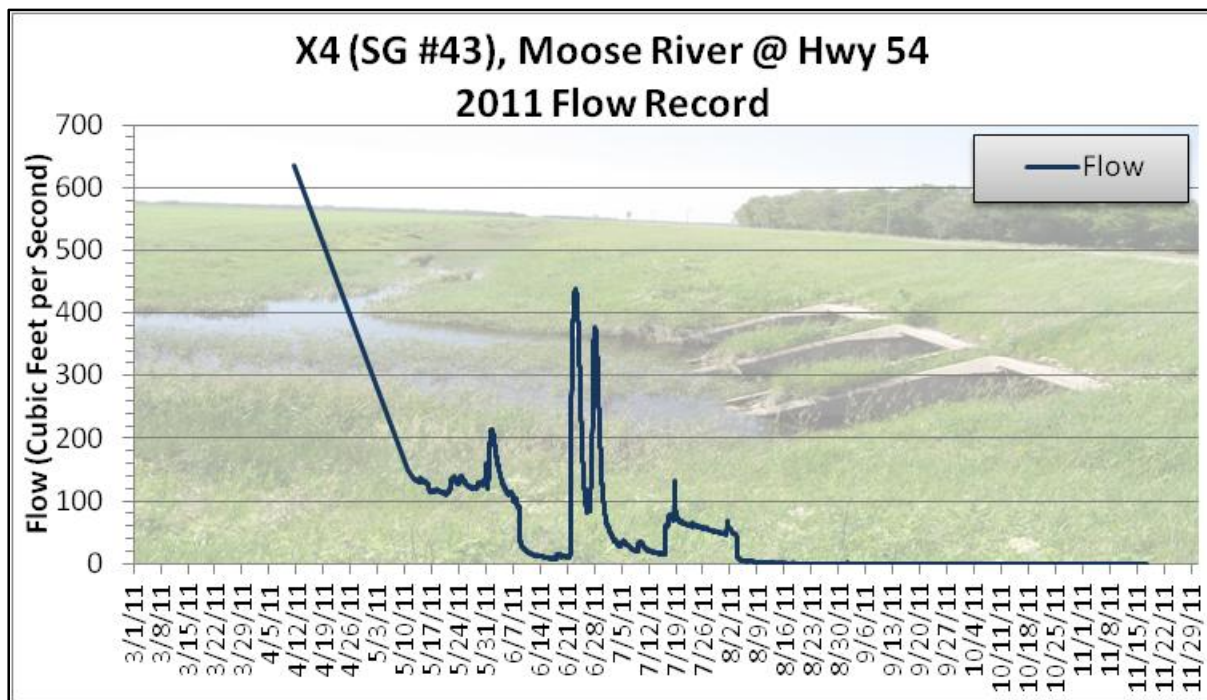
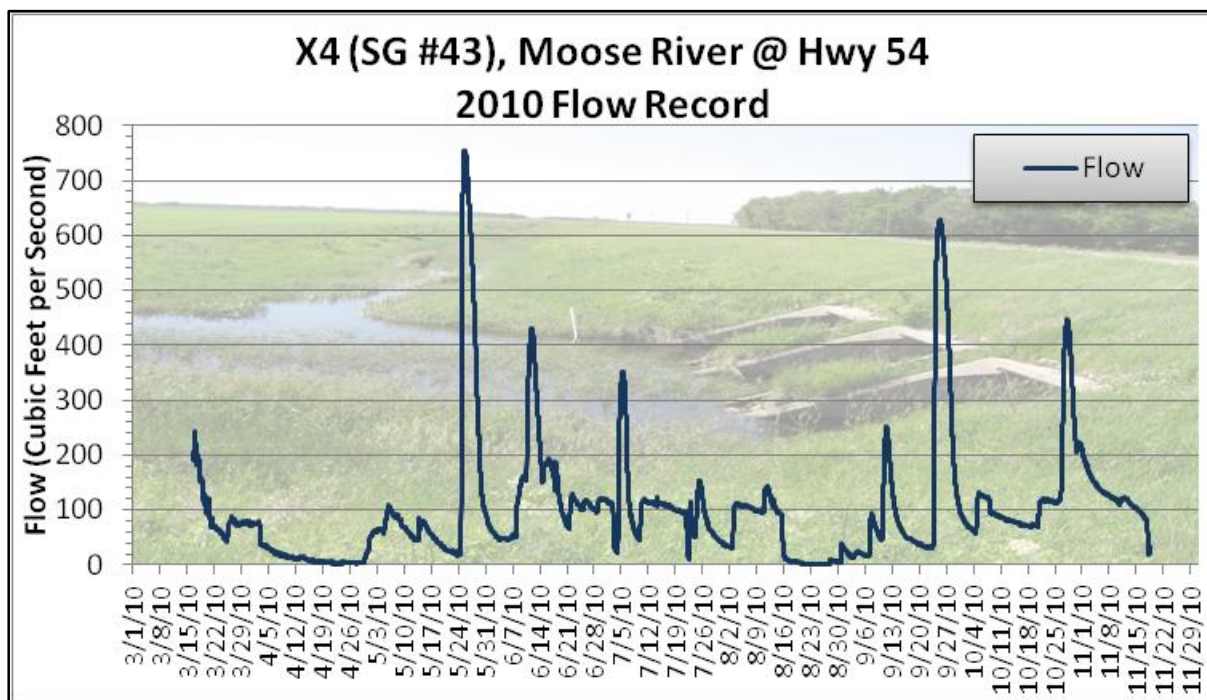
- Retrieved data from the storage module that was used to download data from the CR10 data logger at the Stream Gage #40 site (S002-088) on the Thief River at the County Road 7 crossing. The data logger recorded stage measurements from the ultrasonic gage that was mounted on the bridge. Here is the completed 2011 flow record for that site:



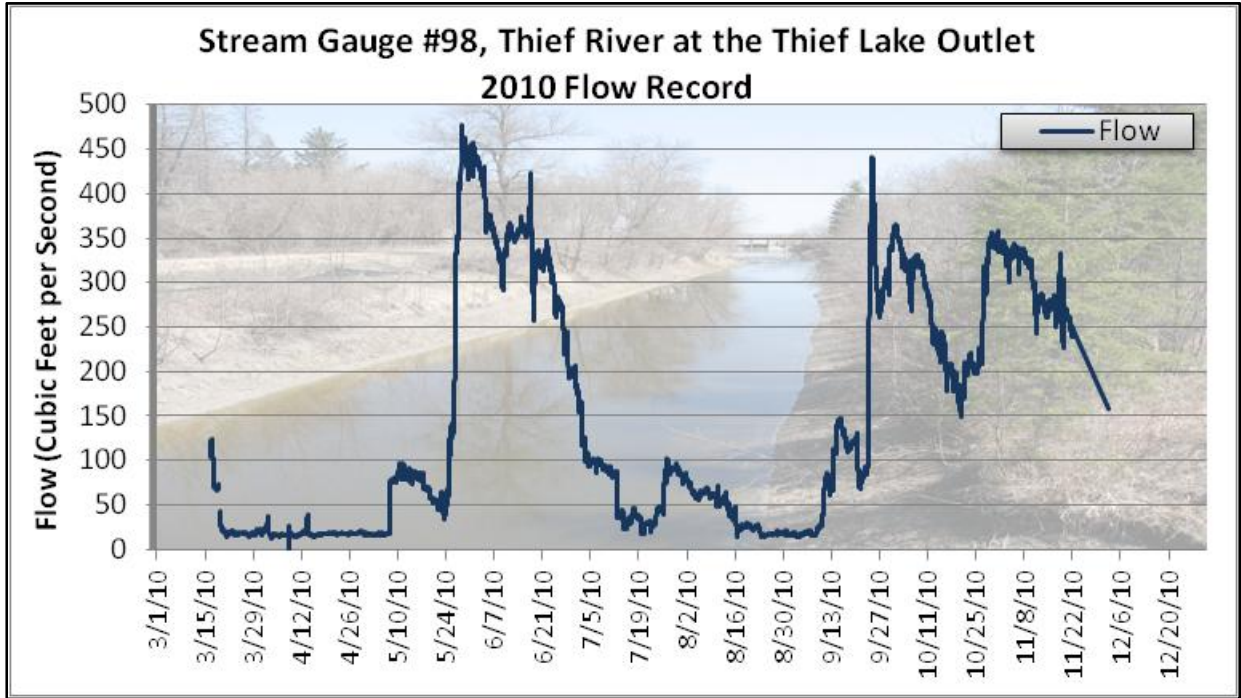
- Compiled and plotted the 2010 and 2011 flow records for Stream Gage #6 on Branch 200 of JD11 (S004-493).



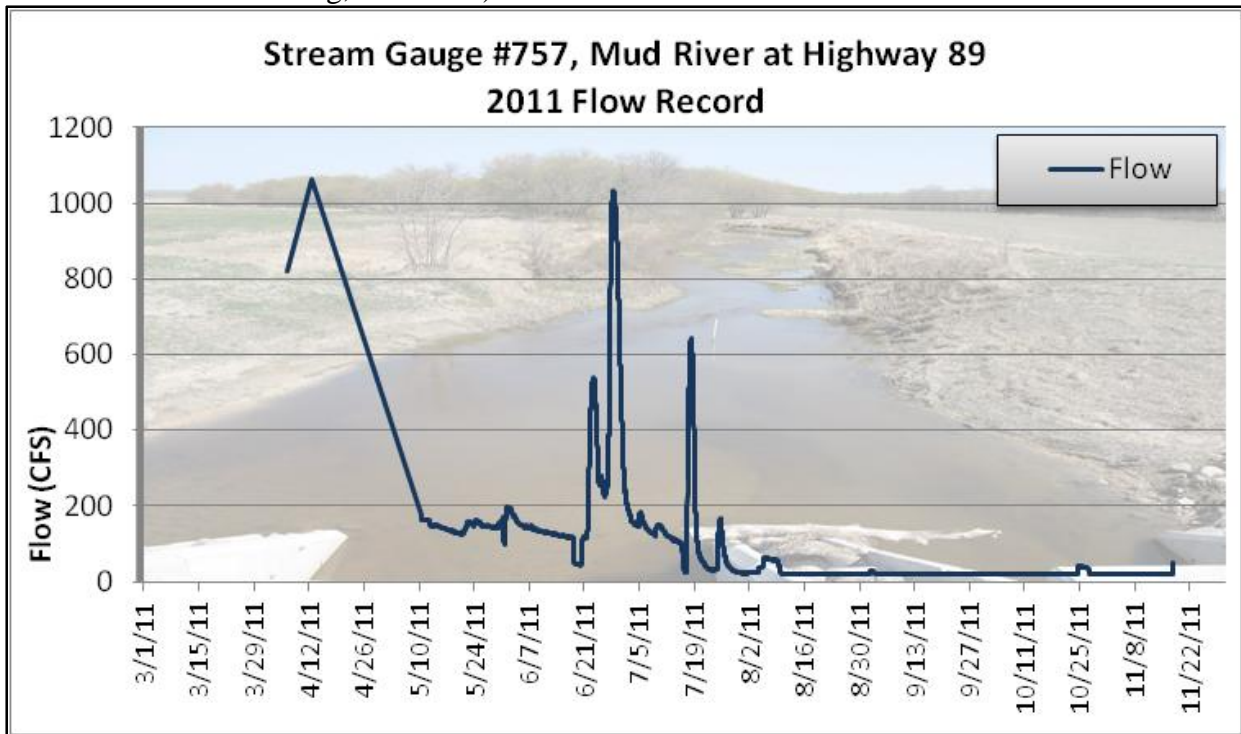
- Compiled and plotted the 2010 and 2011 flow records for Stream Gage #43 (also called X4 and S004-211) and on the Moose River at Hwy 54 of JD11.



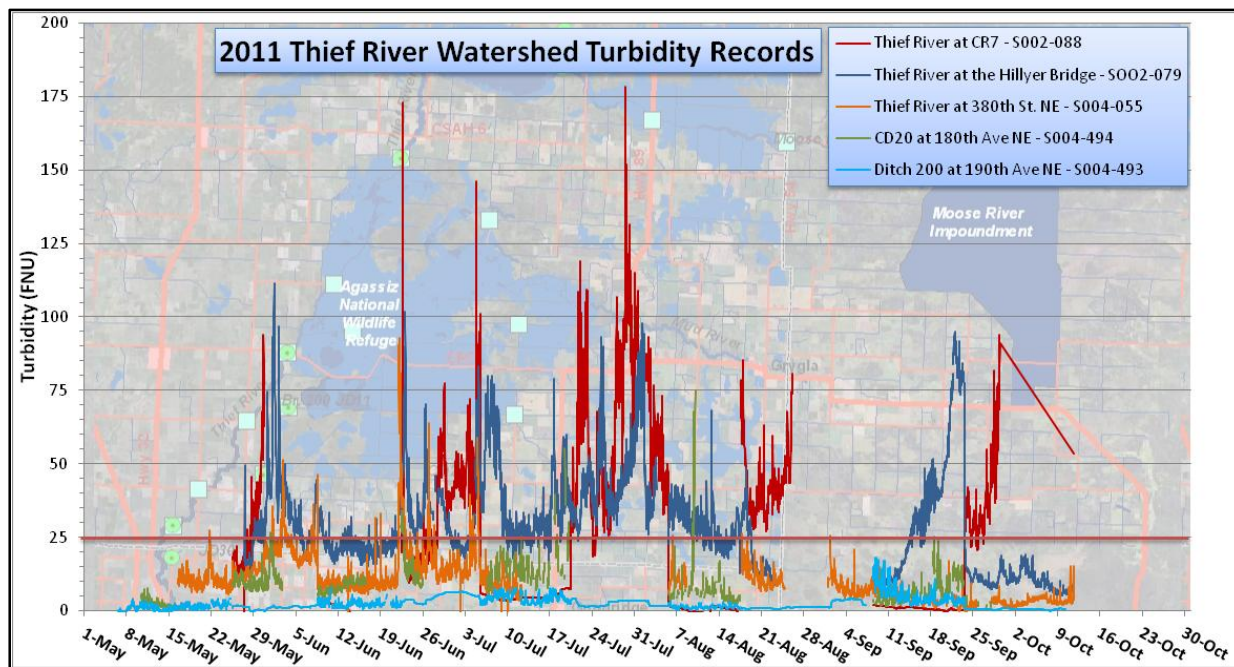
- Compiled and plotted the 2010 flow record for Stream Gage #98 on the Thief River at the Thief Lake Outlet (S002-084).



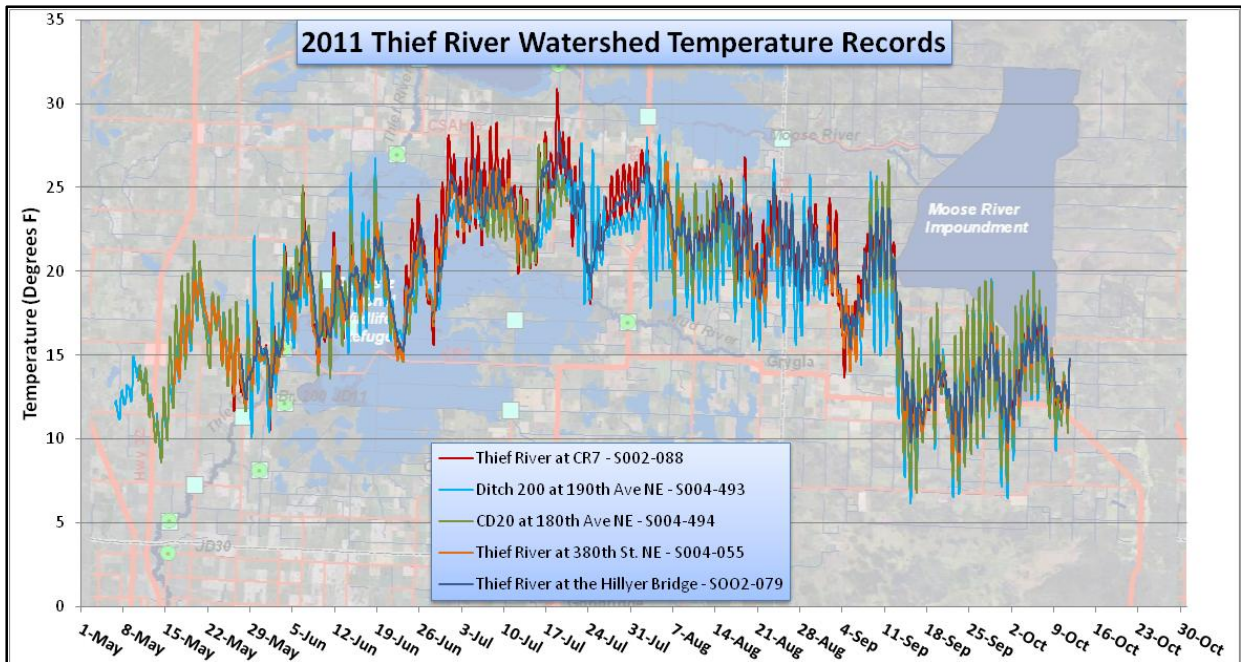
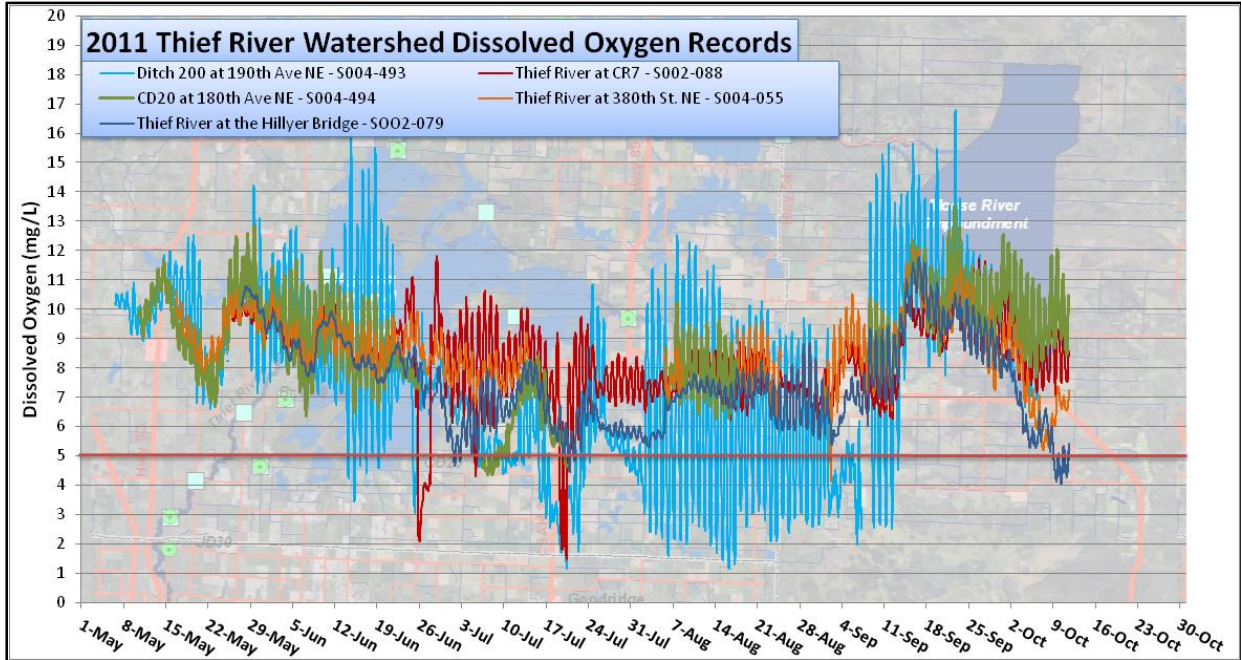
- Compiled and plotted the 2011 flow record for site #757 on the Mud River (Hwy. 89 crossing, S002-078).



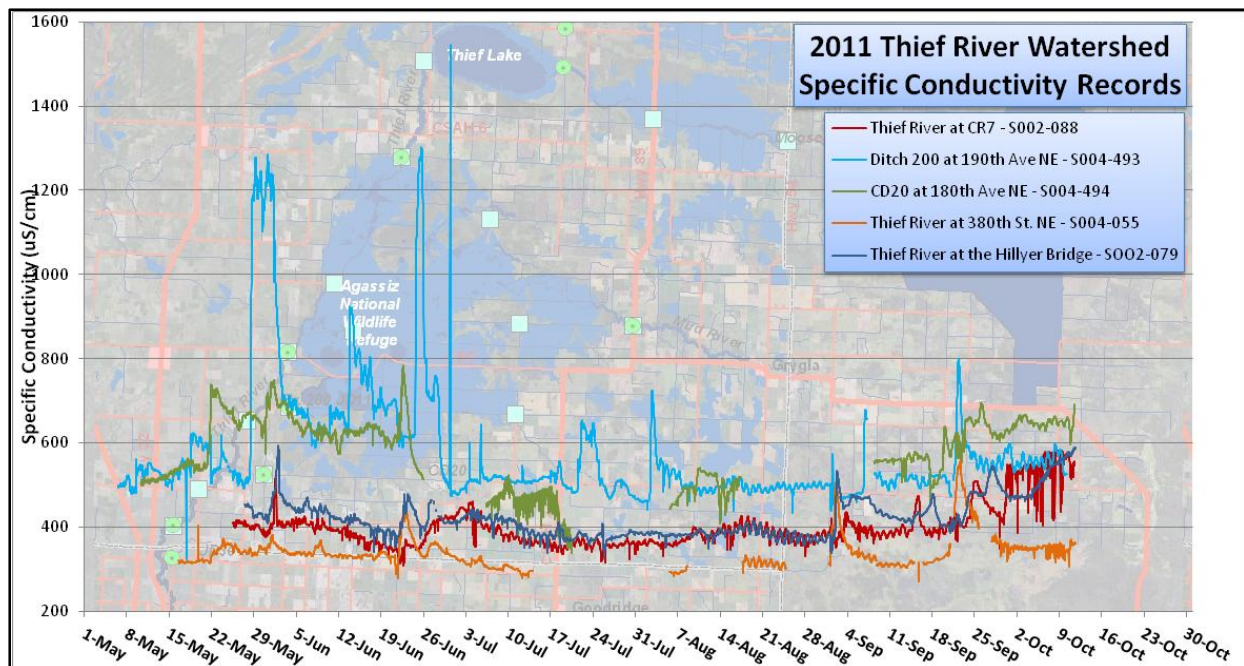
- o Entered pre/post cleaning and pre/post calibration data for the Thief River Eureka Manta multi-parameter sondes. This data was used to calculate fouling and calibration drift for each deployment. The drift values were used to apply a linear correction to the data using Aquarius software.
- o Trimmed out-of-water readings from continuous water quality raw data files.
- o Compiled data for each of the 5 2011 Thief River continuous water quality monitoring sites in Aquarius.
- o Temperature and specific conductivity records at the Thief River watershed continuous monitoring sites did not need any corrections.
- o Turbidity, dissolved oxygen, and pH records from the Thief River watershed continuous water quality monitoring stations were corrected, where necessary, using fouling drift and calibration drift data.
- o Turbidity levels got to be quite high at times on the lower reach of the Thief River (below Agassiz NWR). Because the turbidity probes are calibrated in 10 NTU standard, they are accurate at levels below the 25 NTU water quality standard, but seem to get more exaggerated as turbidity levels increase, particularly when it surpasses 50 NTU (approximately), as shown on the following chart.



- Dissolved oxygen levels dropped below the 5 mg/l standard consistently in the late summer at the Branch 200 of JD11 monitoring site. It occasionally dropped below the standard on the lower reach of the Thief River.



- Some oddly high specific conductivity readings were recorded at the Branch 200 of JD11 monitoring site in the early summer. These readings should be investigated to see if they coincided with impoundment discharge or if they were just caused by sensor error.



- Task 11 – Civic Engagement
 - Lori Clark of RMB Environmental Laboratories worked on:
 - Researching collaborations
 - Planning the public meeting
 - Identifying social networks and contacts
 - Review of the Thief River Demographic Report
 - Lori and I worked on planning a project kick-off meeting for the Thief River Watershed project.
 - It will be held on January 13th, 2012 at the RLWD Office from 10 AM until 12 PM.
 - I updated and added to the list of Thief River watershed stakeholder contacts.
 - I put together a meeting notice and mailed announcements. A copy of the notice is included at the end of this report.
 - A Facebook page was created for the Red Lake Watershed District. By “liking” the RLWD, people can stay updated with meeting announcements, progress of RLWD projects, events, and news. The Thief River kick-off meeting announcement was posted on the page.
 - Like us at: <http://www.facebook.com/pages/Red-Lake-Watershed-District/266521753412008?sk=wall>

- Task 12 – Identification of Sources and Solutions
 - Jim Blix has been working on the terrain analysis for portions of the Upper Thief River watershed.
- Task 13 – Final Reports, Semi-Annual Reporting, and the TMDL Process
 - Met with a technical advisory group (Jim Ziegler, Mike Vavricka, Dave Friedl, Tim James, Jim Courneya, and Bruce Paakh at the Detroit Lakes MPCA office.
 - I updated the group on all the tasks of the Thief River Major Watershed Restoration and Projection Project and got input from the group.
 - Tim James is the new Stressor ID contact for this project.
 - We should have a work plan for Phase II of the project ready by July 1, 2012.

Red Lake River Watershed Assessment Project (Watershed-Based TMDL)

- Task 2 – Water Quality Sampling
 - We received an official notification that our Red Lake River and Grand Marais Creek SWAG application was awarded funding. We also received an updated list of sites from the State MPCA office that was closer to what the Brainerd IWM staff and I had put together. There still were a few corrections that needed to be made to site descriptions.
- Task 3 – Continuous Water Quality Monitoring
 - Purchased batteries for the Eureka Midges that will be used to collect continuous dissolved oxygen data in 2012.
- Task 5 – Flow Monitoring
 - Installed a high water HOBO water level logger deployment pipe at the Burnham Creek monitoring site.



- Task 12 – Final Reports, Semi-Annual Reporting, and the TMDL Process
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Board of Water and Soil Resources Clean Water Funds Have Been Awarded to Soil and Water Conservation Districts for Projects within the Red Lake Watershed District.

- The Clearwater County SWCD was awarded a \$32,260 BWSR CWF grant for the Lost River Watershed Runoff Reduction Project. A primary element of this project involves providing conservation expertise and technical designs to an underserved population who requests no additional government funds for project installation. On this project over 2100 feet of the Lost River shoreland will be improved through installation of buffers, streambank restoration, and livestock exclusion. Other segments of this project will reduce erosion and nutrient concerns in cropland areas of the Lost River by installing side water inlets and shoreland restorations on Pine Lake, the major recreational lake in Clearwater County and a receiving water for the Lost River.
- The Marshall County SWCD was awarded a \$178,750 CWF grant from the Minnesota BWSR for the Accelerated Sediment Reduction Practice Installation along the Upper Thief River Project. Targeted areas within the Thief River Watershed have been prioritized through analysis of sub-basin sediment yields generated by a SWAT model of the watershed. The goal is to establish 75 miles of grassed filter strips, 20 miles of field windbreaks, and install 50 grade stabilization structures where needed. These practices will reduce sediment delivery into the Thief River, Agassiz National Wildlife Refuge and Thief Lake Wildlife Management Area.
- The Red Lake County SWCD was awarded \$120,000 in Clean Water Funds from BWSR for their Accelerated Erosion Control Projects in the Red Lake River Watershed Project. The Red Lake County SWCD conducted an Erosion Site Inventory during the winter of 2009. The results were prioritized and are being addressed in order of importance. Red Lake County SWCD would like to focus on this problem area in Gervais Township Section 7 & 8, from the list of 17 identified in the Red Lake River Watershed, because it is the highest sediment contributor. This project was given high priority because of the DNR sturgeon restoration project taking place in the Red Lake River, domestic supply use of the water source (City of East Grand Forks), the sediment/turbidity impairment, and its recreational use. Initial estimates are that this site contributes approximately 2,200 tons of sediment to the Red Lake River each year.

December 2011 Meetings and Events

- **December 9, 2011** – Red River Basin Monitoring Advisory Committee meeting
 - The Red River Basin River Watch program hopes to form connections between young people and their local rivers through recreation. River Watch has purchased 10 kayaks.
 - Annette Drewes, International Water Institute Water Resources Educator, will be helping schools with their River Watch Forum Posters. Posters will be reviewed prior to the Forum. They will be put together in Power Point, printed on a large format printer, and may also be laminated. So, there will be digital copies of all the posters. There will be links to these posters on the <http://www.internationalwaterinstitute.org> website. This is great news because some of these posters are well done and it will be good to share and preserve the information that they have presented.
 - To increase the students' interest in what they're monitoring, River Watch will be looking for research opportunities for River Watch groups. Instead of just visiting the same sites over and over, students can focus their monitoring efforts on investigative sampling and learning more specific details about what is influencing water quality in their watershed.
 - Annette Drewes has been creating an e-newsletter for the River Watch program called the River Rendezvous. Links to past issues can be found at: <http://www.internationalwaterinstitute.org/riverwatchmain.htm>. Here is a link to the most recent issue: http://www.internationalwaterinstitute.org/forms/RW_Rendez_Issue%2002_Nov2011.pdf.
 - The MPCA will be requiring Surface Water Assessment Grant recipients to use 100 cm Secchi tubes instead of transparency tubes for their transparency readings starting with the new 2012 SWAG projects and for the CSMP program. They are doing this in hope that it will produce fewer ">60" readings and more accurate low-transparency readings. Normal transparency tubes can still be used for 2011 SWAG projects and other water quality monitoring. The Secchi tube measurements will be entered and stored as a new, separate measurement. There were a few people in the RRBMAC group that weren't completely sold on the idea



that these will improve upon what is already being done. The tubes, discs, and string will require more diligence in cleaning than regular transparency tubes. They will require more water to fill than a 60 cm tube would and they will need to be filled all the way to the top, every time. The graduations on the example tube that we had at the meeting were less precise than the graduations on typical transparency tubes. The water quality monitoring staff in the Red River Basin avoid the problems specified by the MPCA by using the appropriate tube for the appropriate water quality conditions. It is very simple to use a 100 or 120 cm tube for clear water and a 60 cm tube when the water looks muddy.

- **December 19, 2011** – Red River Basin Water Quality Team meeting (over WebEx)
 - Minnesota Department of Agriculture Pesticide Monitoring Program
 - Atrazine has been found in 66% of groundwater samples statewide. A lot of the detections were located in central Minnesota.
 - Metolachlor was found in 84.2 % of groundwater samples in Minnesota.
 - The Minnesota Department of Agriculture has found relatively high concentration (11 ug/ml – exceeding the standard) of chlorpyrifos pesticides in the Black River on June 30, 2010.
 - The high concentration of chlorpyrifos coincided with a couple of significant rain events that were large enough to generate runoff. Someone also mentioned that a recent soybean aphid infestation may have led to increased areal application of these pesticides.
 - Chlorpyrifos were also detected in Grand Marais Creek in 2010 and 2011.
 - Surface Water – Groundwater Interactions and Environmental Flows
 - The Clearwater River has a rising trend in withdrawals over the last 20 years and a decreasing trend in flows.
 - Tiling may be negatively affecting recharge in the upper Buffalo River Watershed.
 - The nature Conservancy has completed In-stream Flow Modeling (IFIM) studies in most of the watershed within the RLWD (not done for Grand Marais Creek).

Plans for January 2012

- 2012 budgeting and planning
- 2011 Annual Report
- Red Lake River and Grand Marais Creek Surface Water Assessment Grant (SWAG) Work Plan
- eLINK progress reports for BWSR CWF projects
- Thief River Watershed SWAG progress report
- Sonde maintenance
- Inventory of HOBO water level loggers – how many do we need to buy for the new Red Lake River watershed sites?
- Thief River Watershed Assessment Project.
 - Work with Lori Clark to plan and promote the January 13th meeting.
 - Complete a report on the existing data that is available for the watershed.

- Jim Blix will continue working on terrain analysis to identify potential erosion areas throughout the watershed.
- Semi-annual progress report
- Compile and assess existing data
- Red Lake River Watershed Assessment Project
 - Complete a report on the existing data that is available for the watershed.
 - Semi-annual progress report
 - Start working on civic engagement; work with Lori Clark to plan a project kickoff meeting.
 - Compile and assess existing data

Future Meetings/Events

- **December 9, 2011** – Red River Basin Monitoring Advisory Committee meeting
- **December 19, 2011** – Red River Basin Water Quality Team meeting (over WebEx)
- **January 10, 2012** - Pennington County Water Resources Advisory Committee, 9 AM
- **January 11, 2012** – Marshall County Water Resources Advisory Committee, 9 AM
- **January 12, 2012** – Franklin Middle School Science Fair judging
- **January 13, 2012** – 10 AM until Noon – Thief River Watershed Assessment Project Kick-Off meeting at the RLWD office.
- **January 31, 2012** – First progress report for the Thief River SWAG monitoring is due.
- **February 1, 2012** - BWSR CWF Grant semi-annual progress reports are due.
- **February 1, 2012** - MPCA Thief River Watershed Assessment Project semi-annual progress report is due.
- **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.

Thief River Watershed Assessment Project Stakeholders' Project Kick-Off Meeting

FRIDAY, JANUARY 13TH, 2012 | 10:00 AM UNTIL NOON | RED LAKE WATERSHED DISTRICT OFFICE

About the Project

The Thief River Watershed Assessment Project is a watershed-wide assessment of the water quality, biotic integrity (fish, aquatic macro-invertebrates), and stream channel stability in the Thief River and its tributaries. This project will produce Total Maximum Daily Load (TMDL) reports that describe how water quality problems can be fixed. We will also create protection plans to protect streams with good water quality.

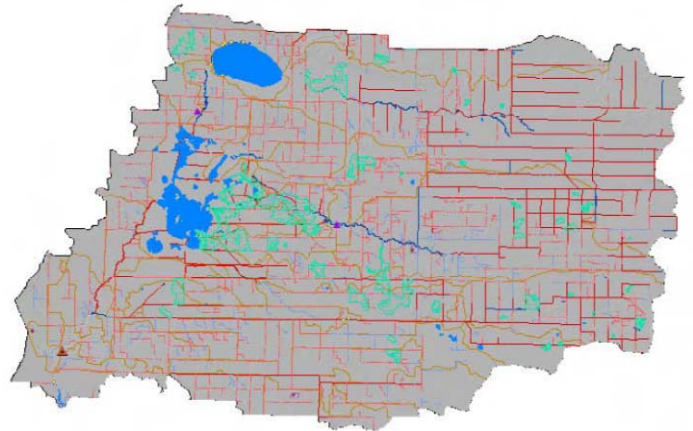
Previous water quality studies in the Thief River Watershed have already led to stream bank stabilization, grade stabilization, and best management practice implementation projects. This project will broaden our knowledge of the watershed and the completion of official TMDLs will open doors to additional funding sources for water quality improvement projects.

This project features an enhanced civic engagement effort in order to gain input for a broader spectrum of stakeholders. Input from stakeholders is very important to the success of this project and future work. You are a stakeholder if you live in, work in, manage resources within, own land in, or have an interest in the natural resources of the Thief River watershed. We plan to discuss questions like these: How does water quality in the Thief River watershed affect you? Which BMP programs work best in the watershed? Are there any sources of water quality problems that have been missed by monitoring? In what ways should the RLWD be reaching out to and involving the public?

Meeting Agenda

- The Importance of Stakeholder Involvement in Watershed-Wide Planning.
- History of Water Quality Monitoring on the Thief River
- What is the Thief River Watershed Assessment Project?
- Progress Report
- Stream Channel Stability Assessment of the Thief River

Donuts and Coffee!



Public Welcome!



RED LAKE WATERSHED DISTRICT

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