BWSR Snapshots

December 2012

NE MN June 2012 Flood Success Story: Knife River Clean Water Fund Streambank Stabilization Project

By Ryan Hughes, Duluth Board Conservationist

The Knife River, a 23.8 mile river located near Two Harbors, is a popular trout fishing river along the North Shore of Lake Superior. In 1998, the river was listed as "impaired" by the MPCA for excess turbidity (excessive sediment and algae in the water). In 2010, the South St. Louis SWCD and MPCA completed a Total Maximum Daily Load (TMDL) study, which was then approved by the United States Environmental Protection Agency.

The plan to improve Knife River focused on addressing peak flows (fast water running through the stream channel during and after rain storms or snow melt) and eroding clay streambanks contributing sediment to the river.

"Before" view of bank failure on the Knife River. Photo courtesy of South St. Louis SWCD (2011).

Through a BWSR Clean Water Fund grant, the South St. Louis SWCD cooperated with fifteen private and public partners to implement strategies to help restore the water quality of the Knife River and make progress towards delisting the river as an impaired waterbody. One project associated with the grant was an innovative streambank stabilization. The project used all organic materials, which included tree trunks, root wads, brush, clay, fine soil, and sod mats of willow, dogwood and alder, used as 'toe-wood' and placed in layers along the streambank with the help of some heavy equipment as seen in the photos.

Floodplain shelf construction using layers of organic material as observed by the Area 3 SWCD JPB/TSA Engineer. Photo courtesy of South St. Louis SWCD (2011).

In June 2012, parts of the northeast Minnesota region received approximately 10 inches of rain in a 24 hour period. The rainfall event was considered a 500-year event.

Many implementation success stories have emerged following a post storm event assessment. One encouraging project was the 'toe-wood' project on the Knife River, which included the carefully engineered use of woody materials and native plantings. Not only did this project prevent erosion at the site during the 500-year rainfall event but it provides evidence that the use of organic materials in streambank stabilization projects can be successful.

Project site post construction. Photo provided by BWSR Duluth office (2011)

This project was the result of a multi-local and state government effort utilizing scientific information in a collaborative decision making process to target and prioritize implementation activities. The South St. Louis SWCD, Lake SWCD, Area 3 SWCD Joint Powers Board/Technical Service Area (JPB/TSA), PCA, DNR and BWSR partnered on the study, plan, grant procurement, landowner participation, design and implementation of this successful, innovative stream-bank stabilization project. For more information and photos or videos on the project or other projects visit the South St. Louis SWCD website or Facebook site.

Project site following June 2012 storm event that delivered over 10 inches of rain in 24 hours. The project was not damaged as a result of the flood. Photo courtesy of South St. Louis SWCD (2012).

2012 BWSR Academy Summary

By Jenny Gieseke, Statewide Training Coordinator

BWSR held the 5th Annual BWSR Training Academy on October 29-31, 2012 in Brainerd, MN. The goal of the BWSR Academy is to provide high quality training for local government staff that maintains and improves the delivery of conservation work and meets the shared expectations of BWSR and local resource management boards. Over 300 people attended this year's Academy, and feedback has been very positive.

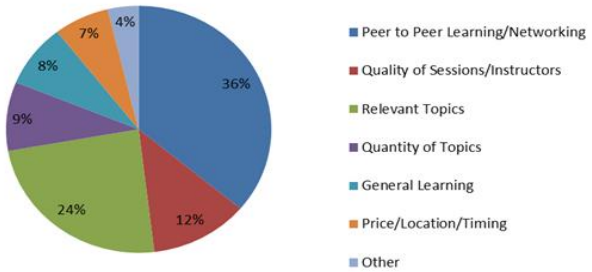
Participants identified two training goals they wanted to learn, apply or be better at as a result of the Academy. The most commonly cited goals pertained to Organizational Capacity or the Wetland Program and 89% of survey respondents indicated they received information at the Academy to meet their goals.

Overall, participants stated the most effective sessions at the Academy were those that were interactive and offered concise information and ideas that could be utilized immediately upon returning to work. The following sessions were identified by participants as most effective.

Session Title
Color Communication
Practical Project Management
Technical Writing
Year End Requirements
The Ins and Outs of Performance Management
Ditches, Dams and Stream Connectivity
Drainage Systems-Setbacks, WCA Exemptions and Restorations
Watershed Based Local Water Management Planning

Finally, we asked participants if they would attend a future Academy or recommend it to others. 99% of the respondents indicated they would attend a future Academy, and 100% said they would recommend the BWSR Academy to others.

Reasons for returning to or recommending the BWSR Academy



Flood Damage Recovery in Dakota, Goodhue and Rice Counties

By Mary (Kells) Peterson, Metro Board Conservationist

Significant damage on agricultural and private lands from the June 2012 floods are estimated to total over $2.6 million dollars in Dakota, Goodhue and Rice Counties. The estimate is from SWCD assessments based on recently submitted MN Recovers Task Force applications. The three counties will be eligible for some of the $11 Million BWSR 2012 Flood Relief Cost-Share funds approved by the State in August 2012.

BWSR staff has been coordinating meetings with Dakota, Goodhue and Rice SWCD staff and NRCS/FSA partners to discuss Flood Recovery policy and implementation including how Federal Emergency Program policy, funding and timelines link with State funds to maximum flood damage repairs. Peterson has met with Dakota County partners to review the status of project implementation and to discuss local methods for prioritizing the funding needs for the spring construction season and beyond.

Typical large scale gullies in fields that did not have conservation practices installed.

In general, SWCD staff reported that existing conservation practices, such as grassed waterways, that were professionally designed and installed performed well and withstood the raging waters caused by over 9 inches of rain in less than 24 hours. In other cases where no waterway existed or was under-designed, gullies washed out fields and carried sediment and nutrients into streams.

A waterway that functioned well under high flows. This waterway prevented soil erosion and filtered flood waters before they reached the river. Photos courtesy of Dakota SWCD.

A BWSR funding recommendation will include information from these meetings and be forwarded to the MN Recovers Task Force Natural Resources Subcommittee, which BWSR co-chairs, near the end of December.

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Hydrology Monitoring of Wetland Restoration Sites Continues…

By Eric Mohring, Hydrologist

What is "hydrology monitoring"? The phrase can mean different things to different people, but in the case of the Road Program, it has mostly meant keeping track of water levels with a combination of staff gauges and shallow water table monitoring wells. These are read manually or with data loggers.

While BWSR staff has been monitoring wetland restorations for over 10 years, the **hydrology monitoring** of wetland restoration sites did not begin in earnest until late 2006. There has been a focus on hydrology monitoring for wetland mitigation bank sites, especially those associated with the Cooperative Road Wetland Replacement Program (or "Road Program").

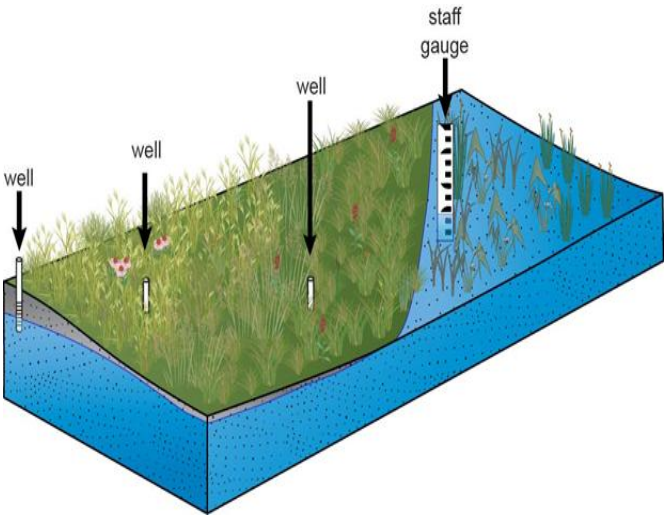

Figure 1: ***Some "tools of the trade" for hydrologic monitoring of wetlands: staff gauge and shallow water table monitoring wells.***

Hydrology monitoring is done to answer specific questions – in our case questions such as: "*has wetland hydrology been restored to the site?*" or "*what is the depth, duration, and frequency of saturation or inundation?*" These are questions that need to be answered in order to get credit for a successful wetland restoration. We have been monitoring hydrology at 14 wetland mitigation bank sites (Figure 2), and have installed 170 monitoring wells or staff gauges.

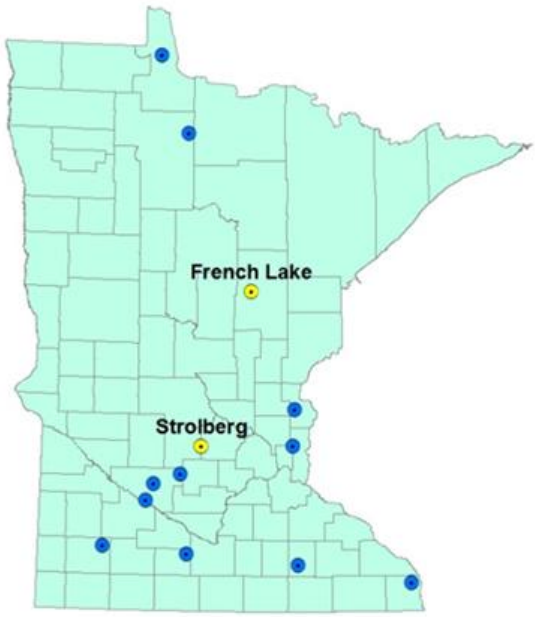

Figure 2: ***Wetland bank sites monitoring hydrology.***

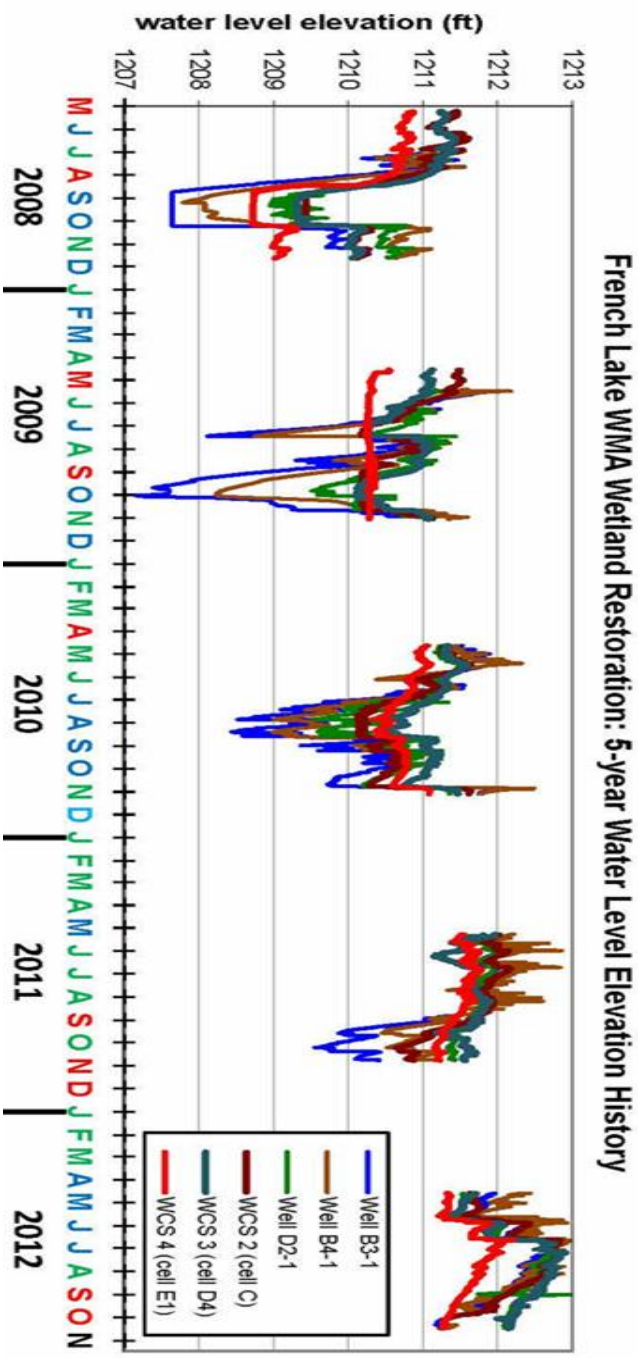

Figure 3: ***Five-year water level elevation history of French Lake WMA wetland bank showing restoration of wetland hydrology. The colors of the month labels indicate wet (blue), normal (green) or dry (red) precipitation conditions.***

At several of the sites, we now have four or five growing seasons worth of monitoring data. It has been gratifying to be able to witness and document the return of wetland hydrology to these sites over a period of years (Figure 3).

However it is not enough simply to keep track of water levels. The water level data must be interpreted in the context of climatic conditions. Periods of abnormally wet or abnormally dry conditions can throw a wrench in our efforts to determine whether wetland hydrology will be present under normal precipitation conditions. Luckily, Minnesota is blessed with one of the best State Climatology Offices in the country. Using the State Climatology Office tools on the web, precipitation records and statistical tools are available from anywhere in the state to help determine what is "normal".

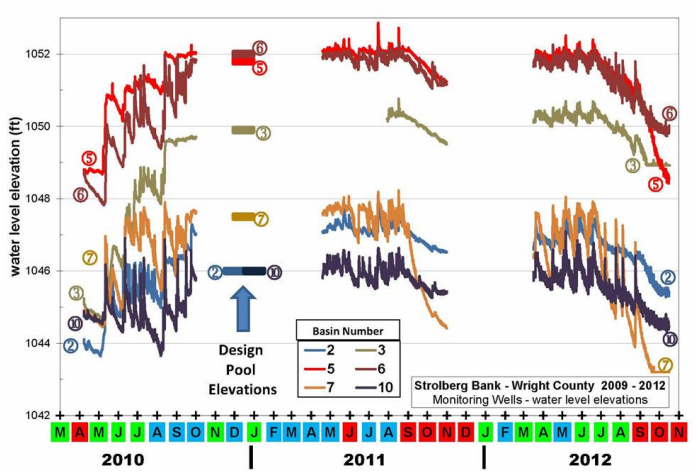

Figure 4: ***Three years of water level elevation data from the Strolberg wetland bank in Wright county. The colors of the month labels indicate wet (blue), normal (green) or dry (red) precipitation conditions. The "design" or "target" elevations are also shown.***

For example, consider the data in **Figure 4**. Have the water levels in the different basins achieved the "design" (or "target") elevations? This would be difficult to determine if we were not able to interpret the water levels in the context of climate. Looking at one year's worth of data (F**igure 5**), we can see the effects of individual rainfall events as well as the overall wet, normal, or dry conditions.

A particularly useful tool is the "30-day rolling sum" of daily precipitation – the squiggly lighter-blue line in the graph at the bottom of **Figure 5**. Each point on the line represents the sum of the past 30 days of precipitation. This can be compared to the range of normal monthly precipitation (between the red and darker blue lines on the graph) to delineate wet, normal, or dry periods (bottom of graph). This helps us make much more sense of what the water levels are doing! What do you think? In which basins did we meet our targets"?

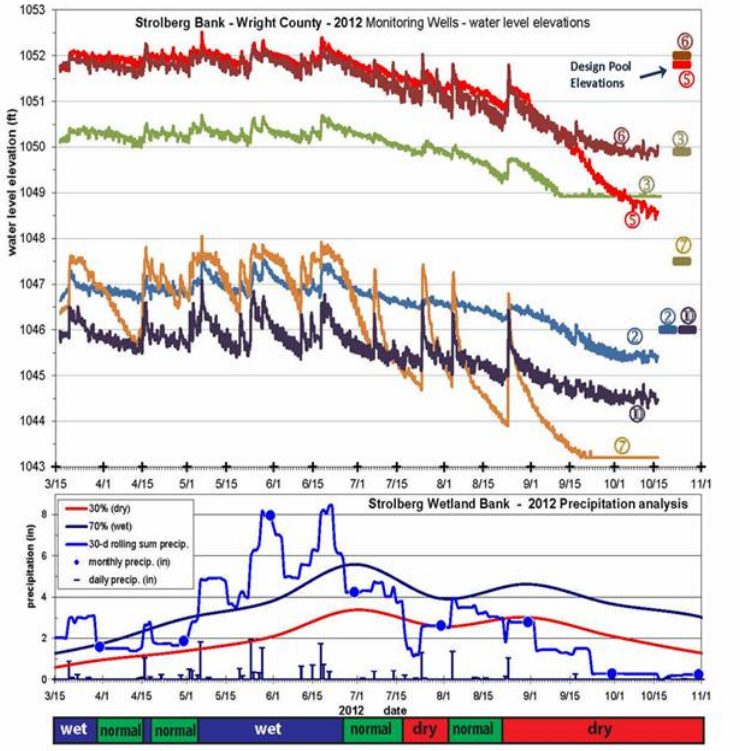

Figure 5: ***Top: 2012 Water level elevations for several basins in the Strolberg wetland restoration, Wright county compared to "design" water level elevations, Bottom: analysis showing daily, monthly, and the 30-day rolling sum of daily precipitation, together with the range of normal precipitation. With this we can determine which periods are "wet", "normal", or "dry," greatly helping in the interpretation of the water level data.***

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