

# Conservation that works: projects outlast floods

In most circumstances, conservation planning and design is not done for the most extreme weather conditions possible. However, many recent conservation projects that were installed withstood the 2012 floods, which was considered a 500-year event.

## Knife River streambank stabilization

Lake and South St. Louis Soil and Water Conservation Districts

The Knife River is a trout stream and listed as impaired with a total maximum daily load (TMDL) for turbidity. This project used natural channel design to stabilize a section of eroding streambank on private property. The design used all natural materials—tree trunks, root wads, brush, clay, fine soil, and sod mats of willow, dogwood, and alder. Less than one year after installation, the project was tested during the June 2012 flood (a “500-year storm”), and successfully protected the streambank with no slumping or major erosion. Based on the proven success of this \$18,000 project, Lake SWCD will use natural channel stabilization methods at other sites along the Knife River to continue to address the TMDL for turbidity.

From left: (pic 1) Bank failure on Knife River prior to project, (pic 2) project construction, (pic 3) project withstands 2012 floods.



## Skunk Creek Flood Mitigation Project

Lake Soil and Water Conservation District



From top: Before and after pictures at Skunk Creek.

Skunk Creek is the main waterway through Two Harbors, Minnesota, travelling almost three miles through upland forests and urban development before emptying into Lake Superior. In 2010, Skunk Creek was listed as an impaired water for turbidity. Skunk Creek has a history of flooding dating back to the early 1900s after the area was transformed by the railroad and logging industry. Stormwater problems have included water pollution, flooding, public roadway damage, property damage, stream bank erosion, and public safety. Following the “4th of July Storm” in 1999, the community of Two Harbors developed and implemented a strategic Storm Water Management Plan with the assistance of the Lake SWCD and numerous additional partners and funding sources. The project included construction of three stormwater detention basins designed to accommodate the 500-year storm event, construction of a rain garden at the Lake County Courthouse and stabilization of several hundred feet of streambank. Flood mitigation practices installed through this project proved successful during the June 19-20, 2012 flood. Despite the extensive damage in nearby Duluth, damage to public infrastructure and private property in Two Harbors was minimal. The initial investment of \$350,000 has been estimated to have saved the city “millions” in potential flood damages in 2012.



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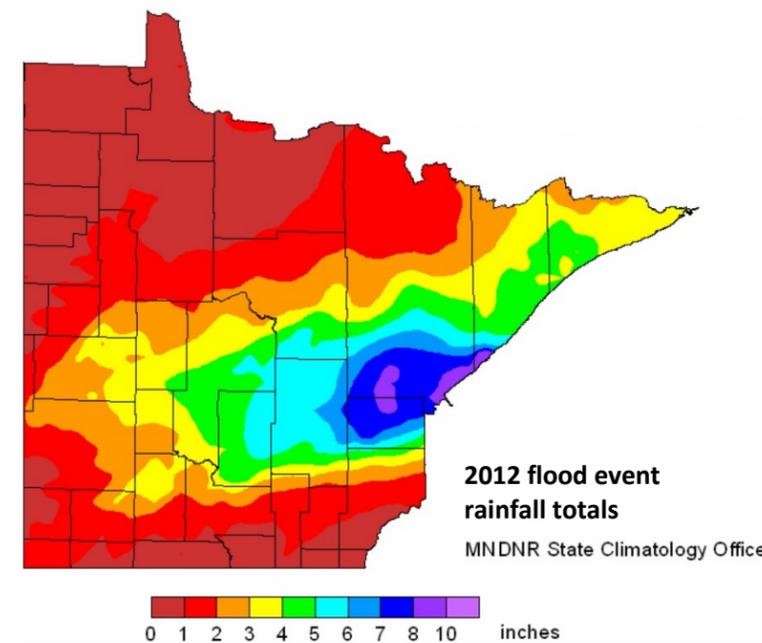


# June 2012 flood recovery effort

## Progress to date in Northeast Minnesota

March 2013

During the time period of June 14-21, 2012, severe storms and flooding caused damage to infrastructure, private/public property and natural environments in several Minnesota counties. A Presidential Major Disaster was declared (FEMA, DR-4069) on July 6, 2012. Counties and tribal lands included in the declaration were: Aitkin, Carlton, Cass, Cook, Crow Wing, Dakota, Goodhue, Itasca, Kandiyohi, Lake, Meeker, Pine, Rice, Sibley, St. Louis, and the Fond du Lac Band of Lake Superior Chippewa, Grand Portage Band of Lake Superior Chippewa, and the Mille Lacs Band of Ojibwe.



**“The most damaging flood in Duluth’s history”** began when heavy rains fell over already saturated ground, making the situation worse. The main event occurred from June 19-20, 2012, when the Duluth National Weather Service reported total rainfall of 7.24 inches. Just northeast of Duluth, the National Weather Service reported 10.10 total inches; Two Harbors received 9.93 inches of rain.

Substantial flooding was reported in many areas around Duluth, including the Lake Superior Zoo. I-35 was closed for a time in Duluth. Highway 61 was closed through June 21 between Duluth and Two Harbors. Road closures were also commonplace in Itasca, Aitkin, Carlton, Southern Lake, and Southern St. Louis counties.

## The state’s response

On Friday, Aug. 24, 2012, Governor Mark Dayton signed a \$167 million disaster relief bill passed earlier in the day by a Special Session of the Minnesota State Legislature. To assist in flood recovery efforts, the Board of Water and Soil Resources (BWSR) received \$11 million to implement erosion, sediment control and water quality protection projects and \$1.5 million to purchase Reinvest in Minnesota (RIM) conservation easements.

Within two weeks of the appropriation, BWSR executed grant agreements and allocated more than \$1 million to eleven soil and water conservation districts (SWCDs) to address emergency flood situations for erosion, sediment and water quality control projects based on preliminary damage assessments and requests from SWCDs. Three projects examples from this emergency funding are highlighted on the next page of this fact sheet.

# Phase I: Tackling emergency flood situations

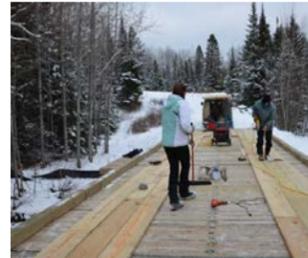
Total phase I allocations to 11 SWCDs: \$1,111,769

## Little Stewart River Bridge -- \$119,672

Lake County Soil and Water Conservation District

This project involved replacing a privately-owned bridge over the Little Stewart River, a trout stream tributary to Lake Superior, near Two Harbors, Minnesota. The previous timber bridge was damaged beyond repair and the bed of the stream was severely altered during the flood. Unfortunately, the bridge was the only way to access the family's home, and they had to hike or bike ½ mile each way to get home after the flood. The cost estimate to replace the bridge was well beyond their budget. Because of the added strain for flood-related costs, the family dealt with possibly not being able to send their eldest daughter, a senior in high school, to college. With funding support from Lake SWCD, the new bridge was completed on December 31, 2012; vegetation will be restored during the 2013 growing season, and the daughter will be off to college come fall.

From top: (pic 1) More than three feet of rock and gravel washed away during flood, (pic 2) landowners saved on project costs by working on the bridge themselves.



## Soil nailing streambank and shoreline protection -- \$174,860

South St. Louis Soil and Water Conservation District

Following the floods, two private homes were severely threatened by bank failure above Chester Creek. A technique called 'soil nailing' was used to stabilize the upper edge.

From left: (pic 1) A retaining wall could do little but hold its shape as it gave way to the forces of gravity and super-saturation, (pic 2) The bench below the wall has been 'hydro-seeded', to begin the re-vegetation process.

## Anderson Dairy Farm manure pit -- \$6,504

Carlton County Soil and Water Conservation District

As Moose Lake residents experienced 30 inches of rain in 30 days, the Anderson Dairy Farm two-million gallon manure pit filled up months before schedule, to within one-foot of the top (pictured at right). Filled beyond capacity, the pit threatened to overflow into a nearby ditch that drains to the Kettle River. Flood relief funds helped to pay for pumping out the pit and spreading the manure on 80 acres of crop fields, according to the Natural Resources Conservation Service crop nutrient management plan.



# Phase II: Repairing private and public property

Total phase II allocations to 7 SWCDs and City of Duluth: \$6,865,892

Following BWSR's emergency allocations, local government units applied through the Minnesota Recovers Task Force (MRTF) process for additional flood response project funds and RIM funds. The Minnesota Recovers Task Force ensures applicants meet the eligibility criteria to receive state assistance funds and coordinate eligible funding sources. After assessing need, determining eligible projects, and working with partners on funding sources, phase II funding will tackle ready-to-go projects to help landowners fix their properties. Allocations in phase II will provide grants for more than 175 projects, all managed by local governments. Three project examples are highlighted below.



## Lake Superior shoreline repair -- \$500,000

South St. Louis Soil and Water Conservation District

Two homes overlooking Lake Superior are facing an emergency bank erosion situation. Engineers are designing a solution, which could include a retaining wall that is pinned to the bedrock. The project will begin spring 2013

## Landslide stabilization near Jay Cooke State Park -- \$7,644

Carlton County Soil and Water Conservation District

Eleven landslides totaling three acres on steep, forested slopes will be addressed in this stabilization project east of Wrenshall (pictured at right). The project includes planting 225 pounds of native grasses and forbes, and 1600 native tree seedlings in spring of 2013. The Carlton SWCD will partner with the Conservation Corps of Minnesota and Iowa to carry out the project.



## City of Silver Bay municipal golf course streambank stabilization -- \$20,000

Lake County Soil and Water Conservation District



The Silver Bay Golf Course had damage to several bridged river crossings for golf cart and maintenance vehicles and extensive debris accumulation following the storms (pictured at left). While the City repaired these issues immediately, much of the damage could be attributed to an eroding streambank. The streambank is forested, but the undercutting erosion caused several trees and a large sediment load to damage downstream infrastructure. This project will stabilize approximately 100 feet of this streambank to minimize erosion and prevent future flood damage.