

The Oxbow

FROM THE NORTH DAKOTA STATE WATER COMMISSION

SWC Funds Rapid Deployment Gages

Following the 2009 flood, it became apparent that it would be of great value to have additional streamflow information in critical areas that could be accessed in a timely manner. In the past, when additional streamflow information was needed in areas where there were no existing gages, or when emergency conditions required more detailed monitoring, the United States Geological Survey (USGS) has used rapid deployment gages - when they were available. In many instances, these types of gages have proven to be

valuable and flexible tools in flood forecasting and response.

Unfortunately, the USGS has not always had enough rapid deployment gages available, as their inventory is used throughout the country.

After the floods of 2009, funds were made available for flood mitigation grants through the Federal Emergency Management Agency (FEMA). To avoid the issue of not having gages available in North Dakota as needed, Water Commis-

sion staff prepared an application for funding to purchase six rapid deployment gages.

The Commission's application was ultimately approved, and the USGS ordered the six gages. During this year's spring flooding, the six gages were installed at Burlington, Minot, Logan, Beaver Creek (below Jamestown), the Highway 46 crossing of the Sheyenne River below Kathryn, and the James River near Manfred.

In addition to the six new gages purchased by the Commission, the USGS deployed ten other short-term stream gages throughout the state in critical areas needing additional monitoring during the spring of 2011.

The total cost of the six gages was \$65,830. Under the grant program they were funded through, 75 percent of the funds were provided by FEMA, 10 percent by North

Dakota's Department of Emergency Services, and the remaining \$9,875 was paid by the Commission. The grant, however, was a reimbursement, therefore the Water Commission had to make full payment of the total cost, and will later request a reimbursement of \$55,955 from the other agencies.

Funding for the total cost of the gages was approved by the Water Commission at their March meeting in Bismarck.



A USGS Employee programs a rapid deployment gage on the Wild Rice River from an Interstate 29 bridge near St. Benedict, ND.

Advisory Committee Meets to Discuss Devils Lake Outlet Issues

On March 30, the Devils Lake Outlet Management Advisory Committee met in Valley City to give the community downstream of the outlet the opportunity to hear the most current outlet-related information, discuss their concerns, and receive answers to their questions.

The Committee meets on at least an annual basis. Topics covered at the last meeting included issues related to the Devils Lake outlet, such as the prior year's operations, winter precipitation, forecasted Devils Lake elevations, projected outlet operations for the coming year, and issues related to construction of the new East Devils Lake outlet.

As discussed in the previous month's issue of *North Dakota Water*, the State Water Commission is moving forward with a 250 cubic feet per second (cfs) east end outlet that will take water via underground pipeline from East Devils Lake to the downstream side of Tolna Coulee. This project is scheduled for completion in the spring of 2012, and is expected to cost between \$62 million and \$90 million.

In addition, the Water Commission has also been looking into a 100 cfs expansion of the west end outlet, although it was reported at the advisory meeting that the additional 100 cfs from the west end will likely be added to the East Devils Lake outlet instead – making it 350 cfs, rather than 250 cfs. Design work is continuing on the west end expansion, but the East Devils Lake outlet with the 350 cfs capacity has higher priority.

Bruce Engelhardt, Director of the Water Development Division at the Water Commission, provided an overview of outlet expansion efforts, and took numerous ques-

tions from the audience on how any new outlets would be operated in response to flows and water quality in the Sheyenne River.

Engelhardt explained that the outlets would only be operated after spring flows have passed, and would be lessened if severe rain events were to occur during the operating season. Engelhardt also told the audience that outlet operations would be constrained to ensure downstream beneficial use of the water is maintained.

Engelhardt talked at length about the Tolna Coulee control structure that will be constructed prior to spring runoff in 2012, in order to prevent catastrophic damages downstream from a natural overflow. Engelhardt stressed that the Tolna Coulee was not being armored, and that the control elevation of the

Tolna Coulee would not be raised above an elevation of 1,458 feet above mean sea level.

DEVILS LAKE OUTLET MANAGEMENT ADVISORY COMMITTEE

The Outlet Advisory Committee includes three Governor-appointed members representing downstream interests, the State Engineer, and representatives from the Red River Joint Water Resource Board, Devils Lake Joint Water Resource Board, Upper Sheyenne River Joint Water Resource Board, Ramsey County Commission, Benson County Commission, and the Spirit Lake Nation.



State Engineer Todd Sando answers questions at the Devils Lake Outlet Management Advisory Committee meeting in Valley City.



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Bill Sharff Receives NDEA's 2011 Human Service Award



On April 9, the North Dakota Education Association's 2011 Human Service Award was presented to the Water Commission's Bill Sharff, who is Director of North Dakota's Water Education for Teachers (WET) program.

The Human Service Award calls public attention to an individual who reinforces the value of giving to others, particularly children, and by their actions have taken upon themselves the responsibility to improve the human condition and enhance its dignity and worth.

Bill has directed North Dakota's Project WET since 1990. During that time, he has been instrumental in delivering Project WET to North Dakota's K-12 educators through 29 instructional institutes, 150-plus credit workshops, as well as hundreds of seminars, water festivals, and in-service opportunities.

Project WET facilitates and promotes awareness, knowledge, exploration and stewardship of North Dakota's water resources, and how water interacts with both the human and natural environments.

Congratulations to Bill for receiving this well-deserved award!



Above: Sharff accepting the award. Below: Kim Belgarde, Bill Sharff, and NDEA President Dakota Draper.

TOLNA COULEE ISSUES

FACTSHEET

FIGURE 1: DEVILS LAKE AND THE SHEYENNE RIVER

BACKGROUND

One of the most urgent water management challenges facing North Dakota for nearly two decades has been the ongoing flooding crisis in the Devils Lake basin. Since Devils Lake began its most recent historic rise back in 1993, from an elevation of 1422.6 feet from an elevation of 1458 feet (above mean sea level), it has risen about 30 feet, and has inundated hundreds of square miles of land.

In its natural condition, Devils Lake is a closed basin lake until it reaches an elevation of 1458 feet, where it naturally spills, through Tolna from Stump Lake, through Tolna Coulee, and into the Sheyenne River (see Figure 1). Should this River (see Figure 1). Should this River occur, there exists the potential for tremendous damages to downstream communities and the aquatic environment.

The Flood Fight

To combat the lake's relentless rise and to reduce the risk of a natural overflow, the State of North Dakota, in cooperation with various local and federal agencies and organizations, has worked to implement a three-pronged flood-fighting strategy. This three-pronged approach has included the storage of water in upper portions of the basin to prevent it from causing additional flood damages around the lake; the implementation of infrastructure, including dams, levees, roadway raises, and structure relocations; and finally, an outlet from the west end of Devils Lake to the Sheyenne River.

In August 2005, construction on a state-sponsored emergency Devils Lake outlet was completed. The outlet was originally built with an operational capacity of 100 cubic feet per second (or cfs). However, in June 2010, the state completed a major expansion to the outlet, increasing its capacity to 250 cfs. The outlet will be in operation again in 2011.

The SWC analyzed a range of additional emergency outlet alternative routes in 2010. Given the urgent need to move Devils Lake floodwater, the East Devils Lake outlet to the Tolna Coulee has been judged the most viable alternative. Design is underway with project completion set for 2012. Modification of the natural outlet at Stump Lake through Tolna Coulee to the Sheyenne River was among the options considered, but is plagued with

At the time this was written, the Water Commission was considering a 100 cfs expansion of the existing west end Devils Lake outlet. In addition, a 250 cfs east end outlet that would take water from East Devils Lake was also being considered; along with a control structure on Tolna Coulee to limit discharge, while allowing natural erosions to occur, should the lake spill. Both the west end expansion and east end outlet were being pursued because it was expected that they could be operated without exceeding water quality standards on the Sheyenne River.

NEW Tolna Coulee Issues Factsheet Available

A new factsheet is available from the State Water Commission titled "Tolna Coulee Issues." The purpose of the factsheet is to provide an overview of the complexities involved in removing additional water from the Devils Lake system via outlets. More specifically, it addresses the many challenges that would be associated with removing water from Stump Lake via the Tolna Coulee. The factsheet also provides background information on the Devils Lake area's flooding issues and the ongoing flood fight.

The Tolna Coulee Issues factsheet is available for download via the Water Commission's website at www.swc.nd.gov. From the website, click on "Devils Lake Flooding" and then "Outlet." The factsheet can also be requested by calling 701-328-4989 or by e-mail, dapetersen@nd.gov.