The Oxbow
FROM THE NORTH DAKOTA STATE WATER COMMISSION

Dickinson Water Festival A Big Success

On September 10 and 11, the Southwest Water Authority and North Dakota State Water Commission cooperatively sponsored the 16th annual "Make a Splash" Water Festival at the West River Ice Center in Dickinson.

Over the course of the two-day event, more than 500 fifth grade students from elementary schools in the Southwest Water Authority's twelve county region participated in the event. Three half-day blocks were available for students to take in four different presentations and activities.

The festival consisted of structured learning stations, demonstrations, and exhibits where student were actively engaged in hands-on water activities and investigations. In addition, the festival provided students with an opportunity to learn about water resources in a way that both complimented and reinforced their traditional classroom learning in a fun and informative manner.

Southwest Water Authority staff and Tina Harding, Director of the State Water Commission's Water Education Program organized the event. Tina coordinates water education programs and services for North Dakota K-12 teachers, pre-service teachers, natural resource educators, K-12 youth, and youth leaders throughout the state.

The program's purpose is to facilitate and promote awareness, appreciation, knowledge, and stewardship of North Dakota's water resources.

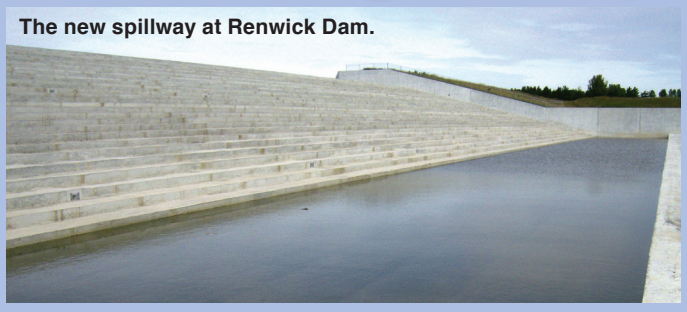
Mark Schneider, from the State Water Commission's Atmospheric Resources Division, presents at the Dickinson Water Festival.

Renwick Dam *celebrating* completion of new spillway

The new spillway at Renwick Dam was recently celebrated with a dedication ceremony for the newly completed rehabilitation project. The dedication took place on Saturday, September 12, 2015. Commissioner Doug Vosper spoke at the ceremony on behalf of the North Dakota State Water Commission. Vosper commemorated the project with many congratulations and much appreciation for the hard work and effort that went into making the project a success. A representative from Senator Heidi Heitkamp's office was also in attendance, along with members from the Natural Resources Conservation Service (NRCS), and the Pembina County Water Resource District.

Renwick Dam, located in Pembina County near Cavalier, N.D. was originally constructed in 1962 as part of the Pilot Watershed Program for the purpose of protecting downstream agricultural lands from flooding. Flood protection made development downstream from the dam possible and many residents and businesses were established in that area.

Water Commission member, Doug Vosper speaks at the dedication ceremony.



The new spillway at Renwick Dam.

In 1978, Renwick Dam was classified as a class c "high hazard" structure by the State Water Commission (SWC), the U.S. Army Corps of Engineers, and the NRCS and was in need of maintenance and rehabilitation. After this determination, the Pembina County Water Resource Board began seeking assistance from the NRCS and the SWC to determine the best alternative to resolve the risk to downstream residences. Over the next several years, numerous groups worked together on the planning, funding, design, and construction of the rehabilitation project.

Construction at Renwick Dam took place from 2009 - 2014 with a Roller Compacted Concrete Spillway being selected as the most cost-effective and adequate design approach. The final phase of construction was completed on schedule in the fall of 2014. In addition, new informational panels will soon be onsite to honor the project. The panels will feature photos and info regarding the initial construction of the dam, the 2013 flood event, and the new spillway.

The North Dakota State Water Commission funded $1.5 million of the $9 million rehabilitation project.

Survey Crew Incorporating New Technologies

The North Dakota State Water Commission utilizes a two-person survey crew who collect elevation and location information. This information supports activities that range from monitoring ground water levels in the extensive network of wells maintained by the Office of the State Engineer, the status of dams and other water resource facilities, special projects such as the Tolna Coulee Control Structure or the Devils Lake outlets, monitoring during flooding events, general hydrologic and hydraulic studies, snow surveys, to verifying the location of the physical structures (monuments) that mark the borders between North Dakota and other states like Montana.

Surveying is defined as determining the exact form, boundaries, position, extent, etc., of a certain area through linear and angular measurements, and the application of geometry and trigonometry. Water Commission staff accomplish this with a wide variety of tools that they use as the situation dictates. While the early surveyors that crossed North Dakota often used a compass, level, and rod, new technologies have become available that can allow for some very interesting and useful types of data to be collected much more easily.

One such discipline is bathymetry, or the study of the elevations of the bottoms of waterbodies. More commonly seeing use in studies of the ocean floor, bathymetry can provide real value to North Dakota's water managers.

Flooding is a common occurrence in North Dakota, and in recent years, significant flooding has impacted all of the major communities in the state. Through the application of bathymetry, the Water Commission is able to develop more accurate models to predict how waterbodies will respond under different conditions, such as the timing and duration of river flows and erosion along a riverbank. In the past, if Water Commission staff wanted to obtain elevation data for the bottoms of water bodies, they had to be standing in that spot, which could be inconvenient, dangerous, or physically impossible.

In the spring of 2015, the Water Commission purchased a new 18-foot boat that can be used to collect bathymetric information, including the elevations of the water surface and bed of the waterbody. The new, larger boat allows for the safe use of the equipment on larger waterbodies, such as the Missouri River.

"By incorporating the new bathymetry equipment into the Water Commission's survey efforts, we will be able to develop a strong understanding of how flows on waterbodies, such as the Missouri River, interact with the channel, from the high flow years, to the more typical years that do not receive as much attention, but are nonetheless important to understand," said Laura Ackerman, the manager of the survey crew.

During the summer of 2015, the survey crew was busy with this technology. In the coming years, special attention is going to be paid to the Heart River-Missouri River confluence, which is an area prone to flooding due to sandbars, ice action, and spring flows. Another key area of focus will be sedimentation around the Devils Lake outlet intakes, and potentially other areas of interest or concern.

"Gaining a better understanding of river dynamics will enable us to do a better job of monitoring and modeling things like flooding, sediment deposition, and erosion," continued Ackerman. *That will produce real benefits for the people of North Dakota in watersheds throughout the state."*

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North Dakota State Water Commission
Todd Sando, P.E., State Engineer
900 East Boulevard Ave. • Bismarck, ND 58505
(701) 328-2750 • http: //swc.nd.gov