

The Oxbow

FROM THE NORTH DAKOTA STATE WATER COMMISSION



James Ternes, Engineer Technician, and Dan McDonald, Survey Crew Manager, collect bathymetry data.



Historic survey photo from the 1890s.

Water Commission Survey Crew Continues to Track Data

The North Dakota State Water Commission and the Office of the State Engineer have employed a survey crew since 1937, when the agency was created by legislative action. The surveyors collect survey data statewide for a variety of purposes, maintain an extensive survey database, implement boundary and elevation benchmarks, collect snow samples, and assist in archiving historic notes, plats, surveys, and photos.

The State Water Commission survey crew is comprised of a two-person team from the Investigations Section, which is part of the Water Development Division within the agency. This section is responsible for various work related to a range of water resource issues, including flood control, irrigation, dam safety, GIS analysis, bank stabilization, and floodplain management.

The state of North Dakota was originally surveyed by the Government Land Office (GLO), a federal government agency. The State Water Commission (SWC) then became responsible for the preservation and dissemination of official government survey plats and field notes for North Dakota. Many of these documents are as old, or older than the state itself, dating back to the late 1800s through the early 1900s.

Today, the SWC survey crew utilizes innovative technology to not only conduct the surveys, but to create and utilize an extensive database. The SWC MapService provides a variety of internet map servers with various themes. The specialized MapService is designed to deliver specific data sets and can greatly increase organization of survey resources. The survey MapService can be found at: <http://survey.swc.nd.gov/>.

Ice forming on the Missouri River is measured to obtain information regarding potential ice jams.



Snow samples are used to measure water content and moisture.

“Survey data is the basis for a lot of water resource studies, including hydrologic and hydraulic studies, and mapping,” said Laura Ackerman, Investigations Section Chief. “The survey crew collected weekly water surface profiles this summer to monitor the high flows of the Missouri River and the data provided extensive and invaluable information.”

In the summer of 2018, the survey crew collected bathymetry data to monitor a part of the Missouri River. Bathymetry allows the agency to develop a better understanding of how the river may respond under different conditions and to track elevation information.

The river data was collected by the survey crew starting in early June through the beginning of October. Once the data was retrieved and downloaded, the survey data was then transferred into GIS, a geographic information system. GIS allows the survey data to be viewed in a map format showing exact locations of each survey shot taken. A graph is then created that plots the water surface elevation along the distance of river that was surveyed.

“The river profiles that are created are useful for visualization of the river’s water surface and to provide comparison profiles which are used to identify

potential changes in the river’s geomorphology, such as aggradation or degradation. This helps us understand the water surface elevations at various flows, and identify the influence that the elevation of Lake Oahe has on the river’s water surface in the vicinity of the Bismarck-Mandan area,” said Ackerman. “The survey data may also be used for the calibration of hydraulic models and may be utilized to create inundation maps.”

The SWC’s survey crew is also responsible for collecting data for ground water monitoring site locations, benchmark locations, point cloud surveys, dam surveys, surface water and gage monitoring, border monument surveys, historic monument surveys, and cross-sections for hydraulic models.

The agency survey crew, along with numerous other experienced land surveyors, recently attended an annual conference hosted by the North Dakota Society of Professional Land Surveyors. Survey work within North Dakota will continue to provide for the needs of the agency and the public throughout the state for many years to come.