

INVESTIGATIONS

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TECHNICAL SUPPORT

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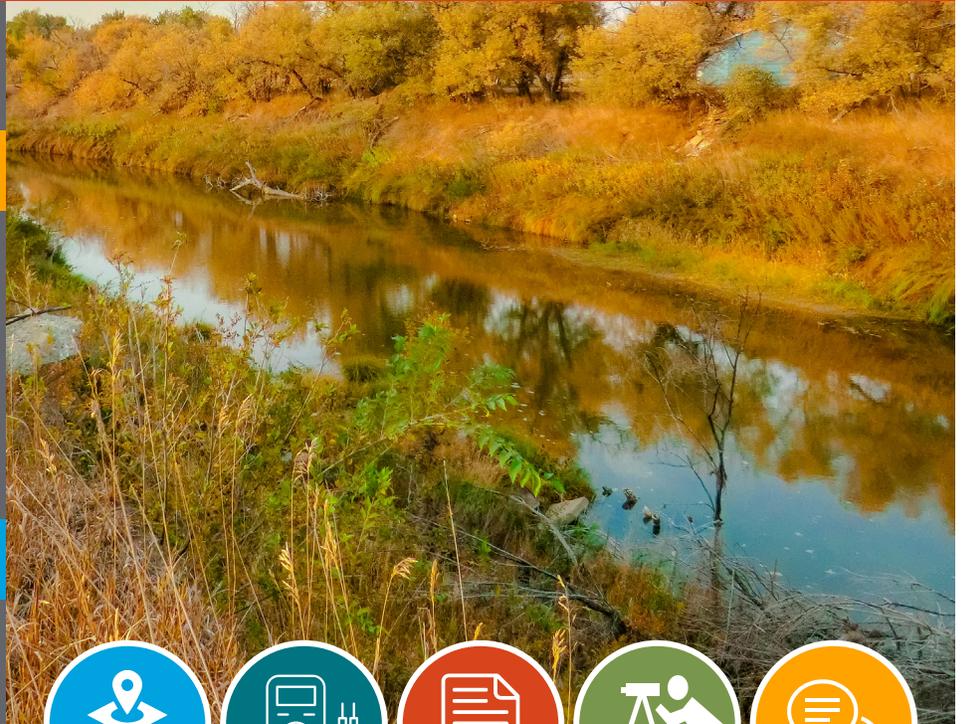
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INVESTIGATIONS SECTION

The Investigations Section (Section) is part of the Water Development Division of the State Water Commission and does work related to a range of water resource issues, including flood control, irrigation, dam safety, GIS analysis and tool creation, database management, bank stabilization, and floodplain management. The Section performs the following functions:

- Preliminary engineering investigations for public entities
- Elevation surveying services
- Creation of hydrologic and hydraulic models
- Technical review of studies and models
- Creation of GIS tools
- Participation in various interagency groups and public meetings
- Emergency response for flooding and dam safety issues



INVESTIGATIONS

Investigations involve conducting feasibility level assessments of surface water projects. These efforts generally include collecting both topographic and water surface elevation data throughout the state, GIS analysis, and the development of hydrologic and hydraulic models. The Water Commission may enter into formal agreements with public entities, such as a state agency, county, or municipality, for an investigation.

Investigations have been conducted throughout the state for dam safety, flood control, drainage, irrigation, and other surface water-related issues. Reports are developed for each investigation in order to provide information to the Water Commission and other entities in North Dakota to assist in making water resource-related decisions. Older reports dating back to the 1960s are often still relevant because these projects and locations may be the subject of future studies. These older reports, as well as current reports, are available at:

http://www.swc.nd.gov/info_edu/reports_and_publications/prelim_engineering_reports/



TECHNICAL SUPPORT

The Section provides technical support on water-related issues for agency, interagency, state, and international efforts. In particular, substantial support is provided for Missouri River and Mouse (Souris) River issues.

Missouri River

The U.S. Army Corps of Engineers operates six mainstem dams for eight authorized purposes on the Missouri River, which is a critical water source as it comprises over 90% of the state's surface water supply. This makes involvement in issues related to river management important. Support is provided, but not limited to, the Missouri River Recovery Implementation Committee (MRRIC), Annual Operating Plan, North Dakota Interagency Emergent Sandbar Habitat Team, monitoring river operations and basin conditions, tracking geomorphic changes, and Surplus Water and Reallocation issues.

Additional information for the Missouri River is available at: http://www.swc.nd.gov/basins/missouri_river/missouri_river.html

Mouse (Souris) River

The Mouse River is located in north central North Dakota and the Canadian provinces of Saskatchewan and Manitoba. Canada and the United States have joint responsibility in operating the four reservoirs located on the river: Rafferty, Grant Devine, Boundary, and Lake Darling. The record-breaking flood of 2011 resulted in basin-wide interest in evaluating ways of reducing flood risk. The Section provides support on Mouse River-related issues by monitoring river operations and basin conditions, tracking the progress of the Mouse River Enhanced Flood Protection Project, supporting studies examining the extreme climate variability of the basin, and participating in the International Joint Commission's Souris River Plan of Study that is evaluating the operating agreement for the reservoirs.

Additional information for the Mouse River is available at: http://www.swc.nd.gov/basins/mouse_souris_river/mouse_souris_river.html



GIS TOOLS

The Section primarily uses open source GIS programs, such as QGIS and GRASS, and creates tools for GIS analysis. For example, a process has been developed to prepare initial data for hydrologic analysis that determines stream networks, basin parameters, outlet locations, and non-contributing areas. Other tools have been created to simplify and speed up GIS work throughout the agency and, therefore, are more general in concept. Below is a list of some tools that have been created.

- Soils Data Miner
- Feature XY Coordinates
- Layer Zoom
- Levee & Channel Builder
- Reservoir Tool
- Points To Line
- Streams
- Basins
- Non-Contributing Area



LAKE GAGES

The Section helps monitor some of the state's closed-basin lakes to gain a better understanding of how water levels fluctuate within the Prairie Pothole Region. When done in conjunction with ground water monitoring, this also increases our understanding of the connection between ground water and surface water in these unique lakes.

Water level information is available on our Mapservice at <http://mapservice.swc.nd.gov/>.

Monitored Lakes:

- Boom Lake (LaMoure County)
- Twin Lakes (LaMoure County)
- Strasburg Slough (Emmons County)
- McKenna Lake, north (Logan County)
- McKenna Lake, west (Logan County)
- Rice Lake (Ward County)
- Tolley Slough (Renville County)
- Lake Laretta (Nelson County)



SURVEY DATA

The Water Commission has employed a Survey Crew since 1937. The Survey Crew collects survey data statewide for a variety of purposes, maintains a survey database, collects snow samples, and assists in archiving historic notes, plats, surveys, and photos.

Types of Survey Data:

- Ground Water Monitoring Site Locations
- Benchmark Locations
- Bathymetry
- Point Cloud Surveys
- Dam Surveys
- Surface Water & Staff Gage Monitoring
- Border Monument Surveys
- Historic Monument Surveys
- Cross-Sections For Hydraulic Models