



ND State Water Commission launches web-based mapping system

By Chris Bader

The Water Commission recently added web-based mapping to the array of web services currently offered on the agency's new website (<http://mapservice.swc.state.nd.us/>). While much of the information presented in the map service has been available from the Water Commission website for many years, the new map services present North Dakota's geographic-based data in a more user-friendly way.

Water Commission data resources that are now available within the map services include:

- Glacial drift aquifers (delineated at 1:500,000);
- Water permit records (including the location and application type);
- Precipitation sites (observed precipitation records throughout North Dakota);
- Driller's logs (contractor logs of more than 55,000 sites throughout the state)
- Ground/surface water sites (more than 33,000 sites throughout North Dakota used for the collection of ground and surface water information, including subsurface lithology, water levels, discharge, and water chemistry data);
- Retention structures (which includes dams, dikes, ponds, lagoons, and dugouts); and
- Drains (includes many of the permitted drains in North Dakota).

Through the map services, North Dakota's water resource data is easier to access, and the new map presentation makes the data easier to understand. It also makes it easier to identify relationships between different types of data.

The map services implemented by the Water Commission were developed around standards-based open source software, including the University of Minnesota's MapServer, PostGIS, JavaScript, MapScript, and PHP. This has resulted in sig-

nificant cost savings, not only in the development and maintenance of software, but also in the underlying hardware support structure.

By using open source and standards based solutions, the Water Commission has successfully integrated the mapping services with current data management systems to provide real-time access to agency resources. The open nature of this type of architecture also provides capabilities to integrate several of the analytical tools required to effectively address issues concerning management of North Dakota's water resources.

The standards based architecture surrounding the open source map services provides many other benefits to the Water Commission. These benefits include the integration with the North Dakota State GIS hub through the use of Web Mapping Service (WMS) protocols— to access base data such as the 2003 color aerial photography,

The screenshot shows a web browser window displaying the mapping service. The map area shows North Dakota with county names and various data layers overlaid. A legend on the right lists layers such as Raster Images, Precipitation, and Political Boundaries. The interface includes navigation tools, a search bar, and a footer with contact information for the North Dakota State Water Commission.

The SWC's new web-based mapping service is found at: <http://mapservice.swc.state.nd.us/>. Or, check out the rest of the new SWC website at <http://www.swc.state.nd.us/>.

USGS topographic maps, and other common base data.

The WMS provides open standard communications protocols that make it fairly simple to include published map resources from other Internet sources, such as the continuously updated weather radar that has been integrated into the Water Commission map services. The WMS makes it easy for the Water Commission to make many of the data resources included within our map services available for others to integrate within their application base. Because of the flexibility of the open source solutions, the architecture of the Water Commission map services provides an efficient tool base to grow and expand map services around other aspects of North Dakota's water resources.

Significant research was conducted prior to the development of the current map services to provide the best tools in the most user-friendly environment.

While the map services published by the Water Commission provide a fairly comprehensive tool base, which includes tools to generate hydrographs, download data, and customizable PDF printing capabilities, they are by no means complete. In the future, additional hydrologic tools, search options, and reporting capabilities will be added to further enhance the capabilities that already exist.

Additional data layers and resources will be made available as the data are completed. This includes such things as the DFIRM maps for flood zone delineation, basin watershed delineations, and additional mapping resources for statewide survey notes and related material.

Please watch for these enhancements and provide any feedback that could help to improve the site to make it more functional.

Upper Sheyenne and Devils Lake Boards release water management plans

By Michael Noone

Late 2005 and early 2006 was an exciting time for two joint water resource boards in North Dakota, as they both released water management plans.

Upper Sheyenne

The Upper Sheyenne Board, which is comprised of counties in the watershed above Lake Ashtabula, produced their first conceptual water plan in late 2005. This plan, which is the first for the basin, outlines

water management goals and objectives for the Upper Sheyenne River watershed. This conceptual plan is an important first step towards the goal of comprehensive, coordinated, water management at the local level. The plan's areas of interest were broken down into five broad subjects: agriculture, economic development, recreation, wildlife and fisheries, and riparian and riverine. The plan will be updated in three years to reflect changing conditions.

Recent work by the Upper Sheyenne Board has focused on exploring



A meeting of the Upper Sheyenne Board in Carrington in 2005.



The Devils Lake Joint Board meets to discuss basin water issues in Devils Lake in 2006.

ways of dealing with aging dams in the basin, many of which were built over 60 years ago. In other efforts, the Upper Sheyenne Board has been actively working on improving water quality in the Sheyenne River, through modified grazing practices that will benefit water quality, while maintaining or increasing cattle production.

For more information, please contact Ben Varnson, Chairman of the Upper Sheyenne Joint Board, ncwrd@polarcomm.com or at (701) 247-2682.

Devils Lake

In early 2006, the Devils Lake Joint Board released the latest version of the Devils Lake Basin Water Management Plan. The 2006 plan is similar to the previous version in that its goal “to develop a comprehensive, coordinated, water management plan for the Basin that will protect the economic and biological values of the Basin while providing optimum benefits for agriculture, wildlife and fisheries, outdoor recreation, economic development, and its’ citizens.” has not changed.

However, the 2006 plan is an improvement over its predecessor in a number of ways. In the goals and objectives, the Devils Lake Joint Board included sections on specific actions to be accomplished prior to the 2009 update of the plan, and a section on actual accomplishments related to the 2006 plan.

Over the last three years, the Devils Lake Joint Board has been incred-

ibly busy pursuing a wide variety of efforts. They:

- Worked with the State Water Commission on the Sweetwater-Morrison water storage project, storing up to 3,500 acre-feet of water;
- Worked with the Bureau of Reclamation to keep the “Road and Railroad Crossing Inventory” of all of the major coulees in the basin up-to-date;
- Provided technical and financial assistance to various organizations in their efforts to develop tours and educational programs in the basin;
- Worked to increase public knowledge about confined animal feeding operations;
- Instituted a “Devils Lake Basin Water Stewardship Award,” which aims to award those people or organizations that have made a positive impact on water resource management in the basin;
- Pursued a cooperative effort with the United States Geological Survey, the Red River Joint Board, and the Water Commission to develop a trend analysis on water quality data collected in coulees in the basin;
- Developed a drainage moratorium in the basin;
- Requested an opinion on the “inundated acres” situation that is afflicting landowners around Devils Lake;

- Cooperated with the Red River Joint Board, to convince the 2005 North Dakota legislature to appropriate funding for the Grahams Island State Park Road raise, which kept the park open to the public;

- Worked with the NRCS on the WRAS water quality study grant in 2001-2003;

- Took the lead on examining options on how best to deal with the Billings Lake interbasin water transfer issue;

- Lobbied successfully to have a seat on the Devils Lake Outlet Advisory Committee;

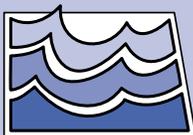
- Secured funds for an exploratory study and test project focusing on irrigation in the basin;

- Held Sub-Basin Advisory Board meetings for all the organized sub-basins in the basin; and

- Worked to analyze the potential for an east-end outlet from Stump Lake into the Sheyenne River via the Tolna Coulee.

For more information contact Michael Connor, manager of the Devils Lake Basin Joint Water Resources Board, at dlbjb@stellarnet.com or at (701) 662-7076.

Both the Upper Sheyenne River and Devils Lake basin’s water plans can be accessed through the State Water Commission’s website at www.swc.state.nd.us. Click on *Water Links*, and then click on *Water Resource Boards*.



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