

Water Review

A Perspective On Western Water Issues Prepared By The Family Farm Alliance And Its Members

NORTH DAKOTA, MONTANA, OREGON

A Tool to Help Western Water Managers in the 21st Century

IRRIGATION DISTRICTS and other local agencies in the West have a challenge of not only managing water, but also their infrastructure, and records.

Infrastructure has to be maintained, and these maintenance needs are growing, since many Western water projects were built in the early 1900's. Many of the records in irrigation district archives are getting old and tattered. There is a need to find permanent means of storing critical documents like engineering plans, maintenance and administrative records.

Water agencies also face substantive reporting requirements, including information such as annual irrigated acres and amounts of water used.

One engineering firm working in Western states has developed a tool to modernize record keeping, share information, and make critical

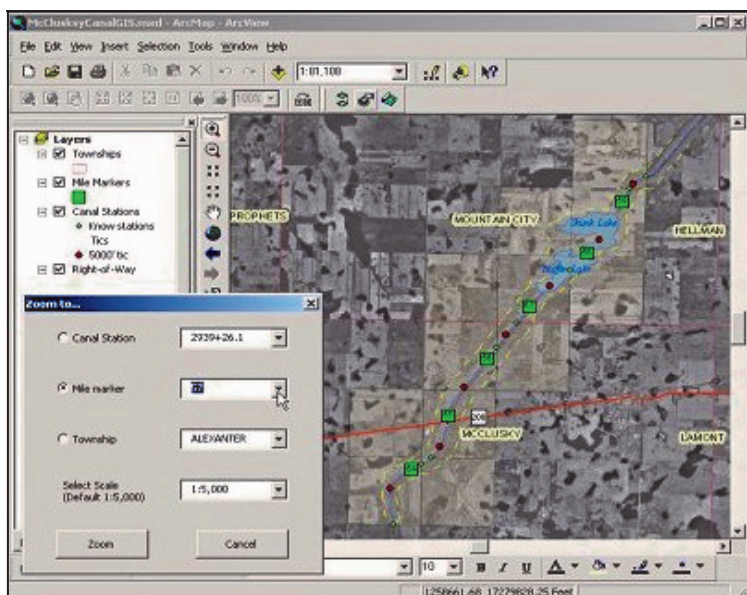
resource management decisions. With the development of desktop Global Information Systems (GIS), irrigator and water users were afforded a means that would allow creating of a desktop GIS, residing on their local computer to manage water, infrastructure and records.

THIS TOOL has been applied to assist irrigation districts and flood managers in Montana and North Dakota, and soon will be used to catalogue and assess water resources of the

Klamath River Basin in Oregon.

This edition of the Family Farm Water Review has been prepared with the assistance of Houston Engineering, a firm with offices in Minnesota, North Dakota and Montana.

Stories are on Pages 2-6



GIS for management of the McClusky Canal in North Dakota
Houston Engineering

Garrison Diversion Conservancy District

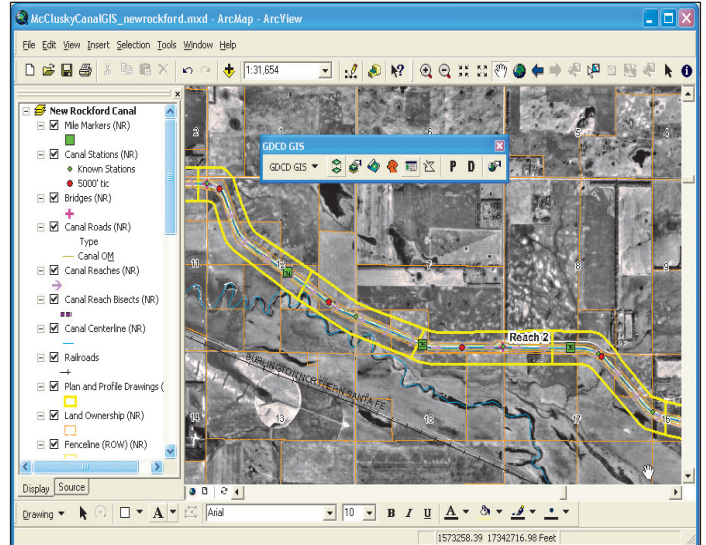
O&M Need Spurs GIS Development

OPERATION AND MAINTENANCE needs prompted the Garrison Diversion Conservancy District (NORTH DAKOTA) to undertake a GIS project. The Garrison Diversion Unit consists of more than 110 miles of canals.

Located in north-central North Dakota, the Garrison Diversion Unit Principal Supply Works includes the McClusky and New Rockford Canals, which total more than 110 miles.

The McClusky Canal is 74 miles long, and is the principal supply canal for the Garrison Diversion

Unit. The McClusky Canal begins at the east end of Lake Audubon and runs east ending near the Lonetree Wildlife Management Area in Sheridan County (NORTH DAKOTA). The New Rockford Canal starts on the east side of the Lonetree Wildlife Management Area, and runs east for 41.5 miles through Wells and Eddy Counties.



Houston Engineering GIS for managing the New Rockford Canal in north-central North Dakota's Garrison Diversion Unit.



U.S. Geological Survey

The McClusky Canal Headgate In North Dakota's Garrison Diversion Conservancy District

Effectiveness in managing these canals is largely based on the available information for managers and operators, because of district's thousands of acres of vegetation, hundreds of miles of roads, and hundreds of hydraulic structures.

The U.S. Bureau of Reclamation and the Garrison Diversion Conservancy District contracted with Houston Engineering, Inc. to develop a GIS canal management tool .

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Garrison Diversion: O&M Sparks GIS Project

(Continued from Page 2)

THE PROJECT consisted of gathering and creating relative information needed to successfully operate and manage the canals using GIS.

This information consists of drains, hydraulic structures, slides, beach belting, plan and profile drawings, utility lines, digital photos and numerous other features related to canal operation and maintenance .

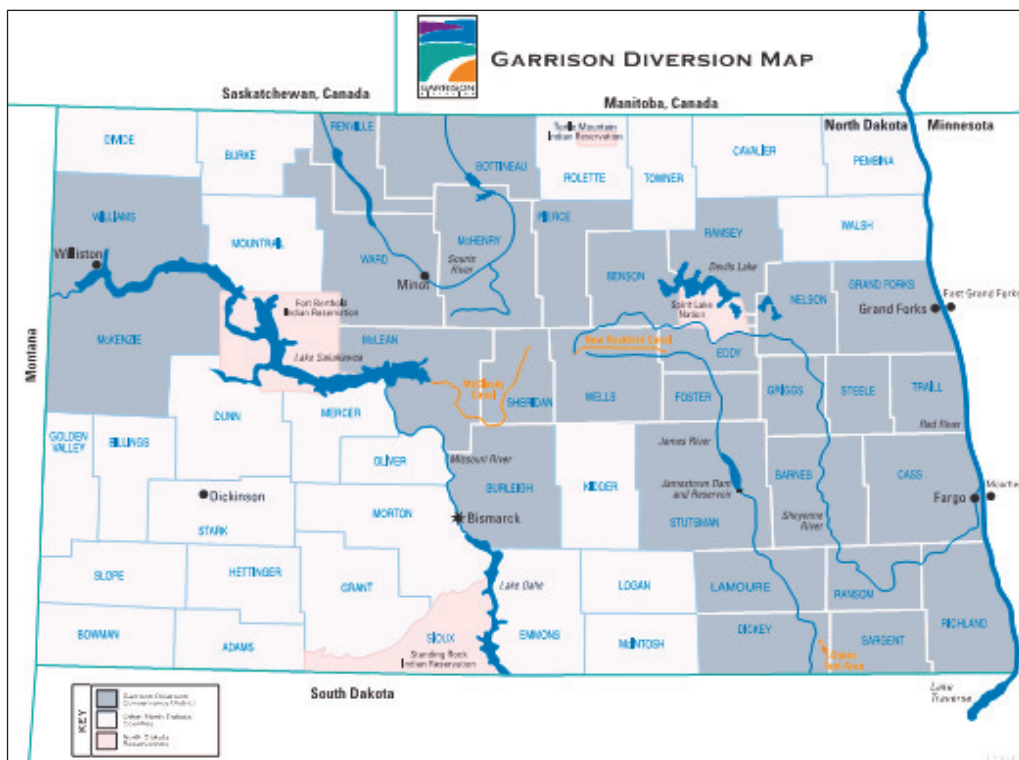
Information was gathered and created by GPS data collection, digitizing, and scanning the information. The project also consists of developing customized tools to aid users with viewing and analyzing the information in Arcmap 8.2.

MANAGERS AND OPERATORS now have an organized inventory of information for the canals that is stored in a GIS format.

“Users can use a customized project to efficiently view, analyze, print, create custom reports and man-

age the information,” said Mark Deutschman, Vice President of Houston Engineering.

“Paper records will also no longer need to be handled delicately and worried about for future users, as they were made available in the GIS system as a scanned image.”



Garrison Diversion Conservancy District

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Or Visit Us On-Line:
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Greenfields Irrigation District

Displaying Information On The Internet

One of the disadvantages of the desktop GIS is that you can't readily share the information among a diverse group very easily. "As use of the internet backbone has become more commonplace, faster and more robust, folks started looking at the internet as a framework for sharing information," said Mark Deutschman, Houston Engineering Vice President.

This included irrigation districts and others responsible for managing water

ONE ORGANIZATION that realized the power of the internet is the National Weather Service, North Central River Forecast Center in Chanhassen (MINNESOTA).

Houston Engineering working on behalf of the International Water Institute, the National Weather Service and the local community, developed an application capable of visualizing flood forecasts; i.e., the results of hydrologic and hydraulic simulations from computer models are processed on the local client and ported to the

internet for display to the general public (www.rrbdin.org).

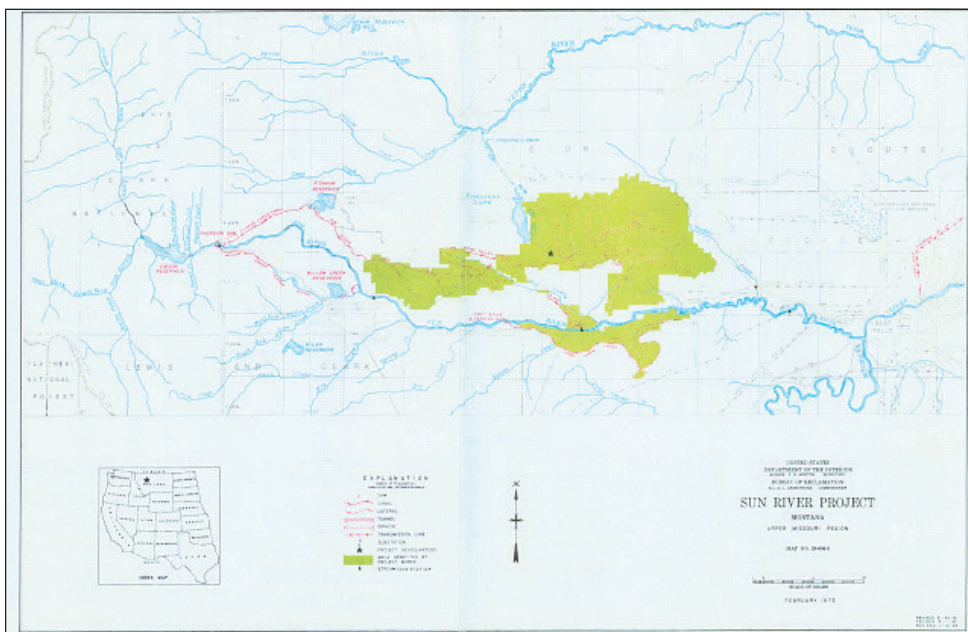
This same concept of presenting information on the internet is being used by the Greenfields (MONTANA) Irrigation District (GID).

GID WAS ESTABLISHED on January 1, 1931, to operate and maintain irrigation canals in the Greenfields division of the Sun River Project in west central Montana.

The GID diverts water from the Sun River below Gibson Reservoir to the Pishkun Reservoir and Willow Creek Reservoir via the Pishkun Supply Canal. Water released from Pishkun Reservoir enters the Sun River Slope Canal and is distributed to approximately 83,000 acres in the Greenfields division.

'Folks started looking at the internet as a framework for sharing information' -MARK DEUTSCHMAN

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Greenfields: Putting The Internet To Work For District

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Effectiveness in the operations and management of the GID is largely based on the information available on the thousands of acres of land and hundreds of miles of canal, laterals and ditches.

GID's records were also old and dated, and records maintenance was a challenge.

"GID had essentially no digital records for their infrastructure" said Deutschman. "They wanted to begin by updating their digital records, with the idea that ultimately they needed a tool to help automate reporting, manage water and maintain infrastructure."

GID STARTED with a cost share grant from Reclamation to update their records. The GIS data created include boundaries for the farm units (the units they use to manage water), and the locations of canals, turnouts, drains and other infrastructure. The data created is smart in the sense that it includes a database of how water moves through the irrigation system. Updating the GIS on an annual basis will eventually become part the district's annual workflow.

"This gave them information at their fingertips, which increased operational efficiency," said Deutschman.

NEXT, THEY wanted to develop an application that would allow immediate access to and reporting of information that they needed and used every day.

Examples of this data included information related to farm unit ownership and operation, the number of acres irrigated, crop types, and tax parcel information. GID managers also wanted to access information about the

amounts of water in the system and water rights. The district ultimately decided to do this through a web application – funded by a grant from the Montana Department of Natural Resources – so that the information could be accessed by many users and shared across the internet if necessary.

Houston Engineering, Inc. developed a password protected internet-based GIS tool to aid in GID's operation and management. The data was gathered and created by scanning, geo-referencing and digitizing the information. The project also consisted of developing a series of high quality wall maps illustrating key GID features. Custom reports can be generated literally at the push of the button thereby substantially reducing the amount of time required.

NOW, REPORTING IS AUTOMATED and instantaneous, as is some information about their infrastructure and flows in the system. GID is currently working on an application that will allow the district to forecast its water demands, based on historic precipitation and evapo-transpiration trends.



Greenfields Irrigation District's Sun River Diversion Dam in Montana.

Klamath County

Data Portal Will Assist The Public In Oregon



Sunset over Upper Klamath Lake.

The success of the approach employed in Montana’s Greenfields Irrigation District is now being implemented elsewhere. The Klamath Basin in southern Oregon has many complex water and resource management issues (*please see January 2008 Water Review*). The Klamath County Board of Commissioners recently decided to begin implementing a web-based Decision Support System.

The Klamath County Board of Commissioners and Houston Engineering will pursue developing a data portal and Decision Support System (DSS) for Klamath County, which would be available through the internet.



Wikimedia

The Klamath Basin. Klamath County is in Oregon.

PURPOSE OF the DSS is to provide public access to commonly requested geospatial (i.e., data related to location) data developed and maintained by the county and commonly requested by the public. An additional purpose for the DSS is to

serve as an initial platform for information, data and resources specific to managing water within the Klamath Basin.

DDS DEVELOPMENT is expected to occur in phases. The initial phase is focused on developing an interactive DSS application for geospatial data within Klamath County and select information within the Klamath Basin. Subsequent phases are focused on the development advanced applications related to hydro-logic forecasting and satisfying water needs. The county intends to closely coordinate with the myriad of other water and environmental agencies and organizations on this endeavor.

Conclusion

These new tools can assist irrigation districts in making day-to-day water management decisions. The GIS system, for example, can be used to estimate crop water demands and water shortages for various time periods. Conserving water is a local, state and national priority, and considerable benefit accrues to both irrigated agriculture and aquatic resources by conserving water.

“These tools are allowing people to solve complex and sometimes competing problems,” said Mark Deutschman, Vice President of Houston Engineering.

TO LEARN MORE

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15 Times In 3 Years

**That's How Often Alliance Leaders
Have Testified Before Congress
on Vital Western Water Issues**

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and Suppliers be Part of the West's
Leading Grassroots Water Organization?**

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(541) 850-9007

