

# Minnesota Ground Water Association

Volume 14, Number 3: September, 1995

## Ground Water Clearinghouse Coordinates Crucial Information

By Suzanne Maeder, Land Management Information Center

Ground water is one of Minnesota's most fundamental resources, and protecting it is a crucial challenge. The quality and quantity of our ground water resources are affected by complex interactions between the natural and built environments, the actions of individuals, businesses, and organizations, and the rules and regulations of local, state, and federal agencies that affect those actions. The absence of an effective and efficient means to provide the information needed to understand the issues related to ground water protection has been a significant obstacle to meeting that challenge.

LMIC, with help from cooperating agencies, has developed a Ground Water Clearinghouse System to provide an effective solution to this problem. The system integrates data from separately maintained state agency files, allowing users to use geographic location to retrieve, analyze and display information related to ground water issues. Developed in response to a legislative mandate in the 1989 Ground Water Protection Act, the system is the first statewide collection of ground water data to be linked to a geographic information system (GIS). Using ARC/INFO, a GIS widely used in Minnesota, the clearinghouse system replaces a more limited purpose ground water database.

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## MGWA President's Column

Fall is almost here, and with it the annual AIPG/MRGS/MGWA field trip. This year's trip to the Iron Range promises to be great fun - I hope to see many of you there. Also on the agenda is the MGWA fall conference. Ms. Carol Kendall of the USGS in Menlo Park will present a full-day seminar on isotope hydrology on October 27 at the Earle Brown Center in St. Paul. Isotope hydrology is used increasingly in Minnesota to evaluate ground water source areas and to age-date ground water. Ms. Kendall's main area of research involves isotope hydrology, and she regularly teaches workshops on the subject. More details are provided inside the newsletter.

Fall also means it's time to nominate Board members for the 1996-1997 term. Candidates are needed for the posts of President-elect and Secretary. We also need someone to take the role of advertising director for the newsletter. This is a non-elective position that involves contacting our advertisers, keeping accounts current, obtaining ad copy, etc. Jan Falteisek has been handling this task for several years, and will be available to assist the new advertising director. Please call me or one of the other Board members if you're interested in running for the Board or in helping with the newsletter, or if you wish to nominate someone for these posts. (It's really kind of fun.)

As you recall, last year the MGWA membership approved changes to our by-laws that make it possible for the MGWA to change its non-profit status to a 501(c)3 type (educational) from our current 501(c)4 (civic league) status. The primary reason for the change is that our current classification doesn't match the MGWA's goals

to promote a better understanding and use of Minnesota's ground water resources (in short, education). There are advantages to 501(c)3 tax status, including reduced postage rates, the fact that donations to the MGWA would become tax-deductible, and that the MGWA would become eligible to receive grants from foundations, many of which can provide grant money only to 501(c)3 non-profit organizations.

Becoming a 501(c)3 organization requires completion of a lengthy internal revenue service (IRS) application form that documents past activities and finances of the MGWA. In addition, there are specific financial requirements that apply to 501(c)3 organizations, such as the requirement that 30% of the organization's income be from charitable contributions. We were fortunate to have Ms. Norma Jean Falink, an accountant who specializes in non-profit organizations, attend our July Board Meeting and provide us with an overview of these issues. This fall the MGWA Board will consider various approaches to achieving 501(c)3 status and incorporating the associated requirements into our organization.

—Cathy O'Dell, MGWA President

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## Ground Water Clearinghouse, cont.

By integrating independently maintained databases and adding the capacity for spatial analysis and map production, the clearinghouse system provides the information required to improve the effectiveness of ground water management while reducing the overall cost of information management — helping us to do better but live within our means.

### Data Sources

In designing the clearinghouse database, LMIC has focused on data integration rather than data production, concentrating on obtaining and merging major, statewide databases into the system, along with defining streamlined, routine data updating procedures. Clearinghouse data are obtained from the Minnesota Geological Survey; the state departments of Natural Resources, Health and Agriculture; the Pollution Control Agency; and LMIC. The cornerstone of the clearinghouse is the County Well Index database maintained by the Minnesota Geological Survey. Using software provided by MGS, counties can easily generate well information that can be integrated within the clearinghouse system. Data that are currently or shortly will be available and their sources include:

- **County Well Index** (Minnesota Geological Survey): basic well information, construction, stratigraphy and well locations, along with some water level and water chemistry
- **OBWELL** (Department of Natural Resources): statewide ground water level monitoring network data
- **SWUDS** (Department of Natural Resources): statewide use information from water appropriation permits
- **Ambient/GWMAP** (Pollution Control Agency): statewide background water quality monitoring network
- **Pesticide Monitoring Data Base** (Department of Agriculture): statewide water quality monitoring for pesticides

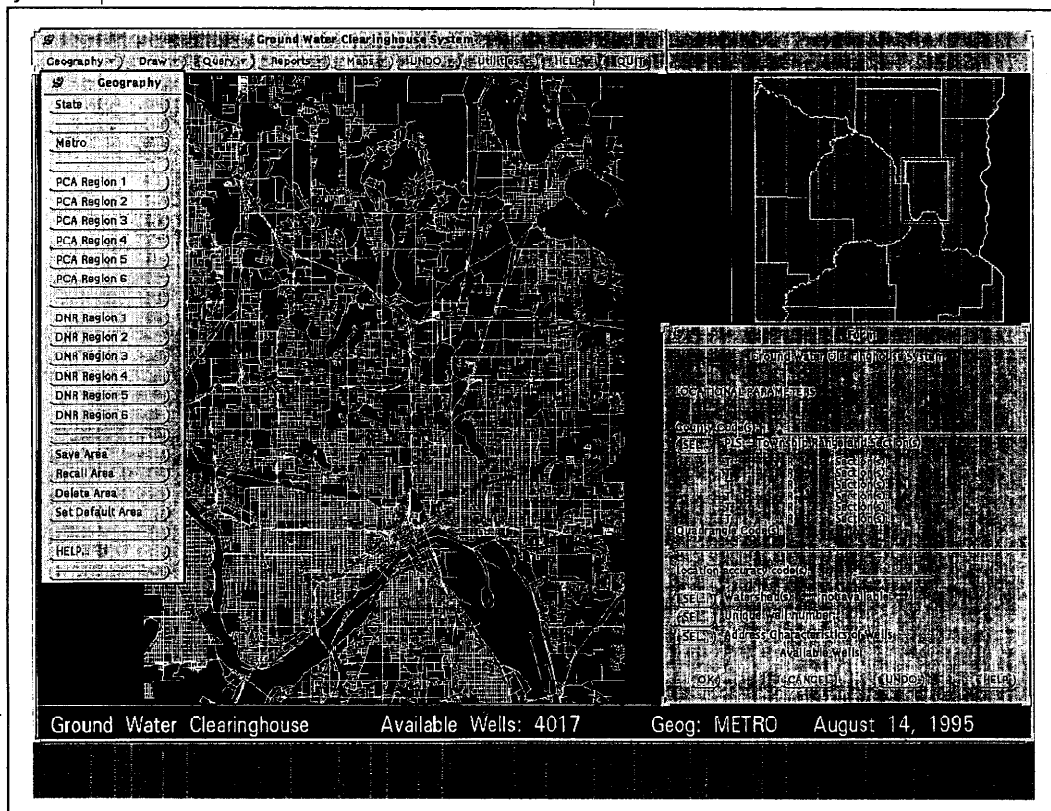
## System Design

The system's database is comprised of two major components: a map library, containing geographically referenced graphic files of well locations, surface hydrology, major infrastructure, political boundaries, and coordinate control features; and database tables containing data about the wells, including well descriptions, water quality, levels and use. The map library uses counties as the basic data storage unit, or tile.

All thematic data layers within the map library are geographically referenced so that both multi-layer display and analysis are possible. Using a consistent coordinate system, they can also be used with other digital data when appropriate, such as land use, geologic features and potential sources of contamination.

The map library contains the following for each county. Descriptive data about each well — ownership, location, use, aquifer, and depth are stored with the basic well data within the map library.

- **Well locations:** This is the principal reference for the clearinghouse system, derived from field-verified 1:24,000 scale sources provided by MGS where available. For wells where no field verification had been done, the public land survey location reported by the well driller was used. Since well location accuracy varies, an accuracy code is stored with each well record. Wells are identified by their Minnesota Unique Well Number, assigned using the Minnesota Department of Health's Water Well Driller Log form. This identifier links the well's map representation to data associated with it.
- **Surface hydrology (lakes and rivers):** From the USGS Digitized Line Graph Hydrology database, with a scale of 1:100,000.
- **Major and minor roads:** From the Census Bureau TIGER transportation files with a scale of 1:100,000.
- **Railroads:** From the Census Bureau TIGER transportation files



—This is a sample screen from the Ground Water Clearinghouse, featuring Ramsey County, and showing the Main Menu Bar, Geographic Area Selection Menu, and the Locational Query options.

## Ground Water Clearinghouse, cont.

with a scale of 1:100,000.

- **Minor civil divisions (cities and townships):** From the Census Bureau TIGER files with a scale of 1:100,000.
- **USGS 7.5-Minute Quadrangle Map Boundary:** Generated by LMIC from map corner points with a scale of 1:24,000.
- **County boundaries:** From the Census Bureau TIGER files with a scale of 1:100,000.

In addition to the primary data maintained within the map library, the following data are obtained from major agencies with operational responsibilities related to the ground water and integrated within the Ground Water Clearinghouse system.

- **Construction:** Information on the water well's construction as reported on the Health Department well driller log and associated forms
- **Stratigraphy:** Information on the geologic formations encountered in the drilling, driller description from the Health Department well driller log, as well as interpreted stratigraphy entered by the MGS, where available
- **Water level observation:** Depth-to-water-level readings at well sites
- **Water chemistry sample:** Information about water quality sampling at a well site, including agency or program and sample number and date
- **Water chemistry analysis:** Results of water chemistry sampling, including parameter tested, results, units, method and reliability.

### System Capabilities

- Using clearinghouse system menus, users can request information about well location, water quality or water-level information, view well locations and information about them, generate reports and create paper maps. In addition to well locations, users can display other important features, such as surface hydrology, the transportation network, county and municipal boundaries, and public land survey boundaries. The following options are provided by the Ground Water Clearing-

house system's menu interface.

- **GEOGRAPHIC:** Selects a geographic area of interest, which can be a single county or a multi county area.
- **QUERY:** Defines search criteria that selects well records of interest. Criteria can be any combination of location and well attributes — use, depth, aquifer, water levels or water quality. For instance, all wells in a spatially defined area having a certain range of well depths.
- **DISPLAY:** Shows the location of selected wells on the screen, along with surface hydrology, the transportation network, county and city boundaries, and public land survey boundaries. Using DISPLAY, users can zoom into a smaller area for a more detailed view.
- **REPORT:** Creates a number of specific reports about the wells chosen, including cover well description, well construction and stratigraphy, and water levels, quality and use.
- **MAP:** Interactively creates hard copy maps of the area shown on the screen, a U.S. Geological Survey 7.5-minute quadrangle or a county map, using the subset of wells selected and specified auxiliary data layers.

### Accessing the System

LMIC is responsible under the Ground Water Protection Act to provide on-line access to the Groundwater Clearinghouse system for the Departments of Agriculture, Health, and Natural Resources, and the Pollution Control Agency. Appropriate mechanisms for access are being explored for users within those agencies. The technical requirements for the functions described here include a Unix-based workstation or a PC with X-terminal emulation software plus access to the Internet. More limited capabilities are available to staff without these resources.

LMIC is exploring other solutions to those needing data about ground water, especially for counties involved in local water planning, including solutions suitable for ARCView and

—continued beneath officer listing

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## Ground Water Clearinghouse, cont.

EPPL7. For more information on how to access the Ground Water Clearinghouse, contact Susanne Maeder (612)297-4986 at the Land Management Information Center.

—Reprinted with permission from the Fall, 1995 issue of GeoDES, the newsletter of the Land Management Information Center Planning.

## Reports & Pictures from Spring Geology Field Trips

These notes of thanks were received from geology departments at St. Cloud State, the University of Minnesota, and Carleton College for support provided by MGWA on spring field trips.



the arches in hand. Ground water sapping structures, one of which is the back drop for the enclosed photograph of the group, were visited on the third and fourth days, along with exploration of Holocene stratigraphy in Montezuma Creek. The last three days were spent on the San Juan River, floating through the famous Goosenecks and speculating on their origin. An additional theme that permeated the trip was evolution of the slopes that comprise the spectacular landforms of the Colorado Plateau.

For his term project in the course, one of the students developed a two-dimensional numerical model of ground water flow toward a sapping hollow, and consequent evolution of the hollow. His model worked well initially, but as the hollow evolved into a deep valley, it developed a keyhole shape which is not observed in the field. Taking some additional factors into consideration would probably

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### St. Cloud State - Florida Keys

Thank you so much for the \$300 check. We have already put it to good use for our annual Spring Break field trip. This year we took 21 students to the Florida Keys to study Carbonate sedimentation. We were gone during March 3 - 11 and stayed at Pigeon Key, a small island about 2 miles west of Marathon in the central Florida Keys. We snorkeled around Pigeon Key for two days, visited Bahia Honda State park, and spent a day at Big Pine Key. The rest of our time was spent visiting other localities and working on small group research projects. We did have a chance to spend some time at Big Pine Key to talk about the ground water hydrology of the island and visit Blue Hole, the only fresh water lake in the Keys.

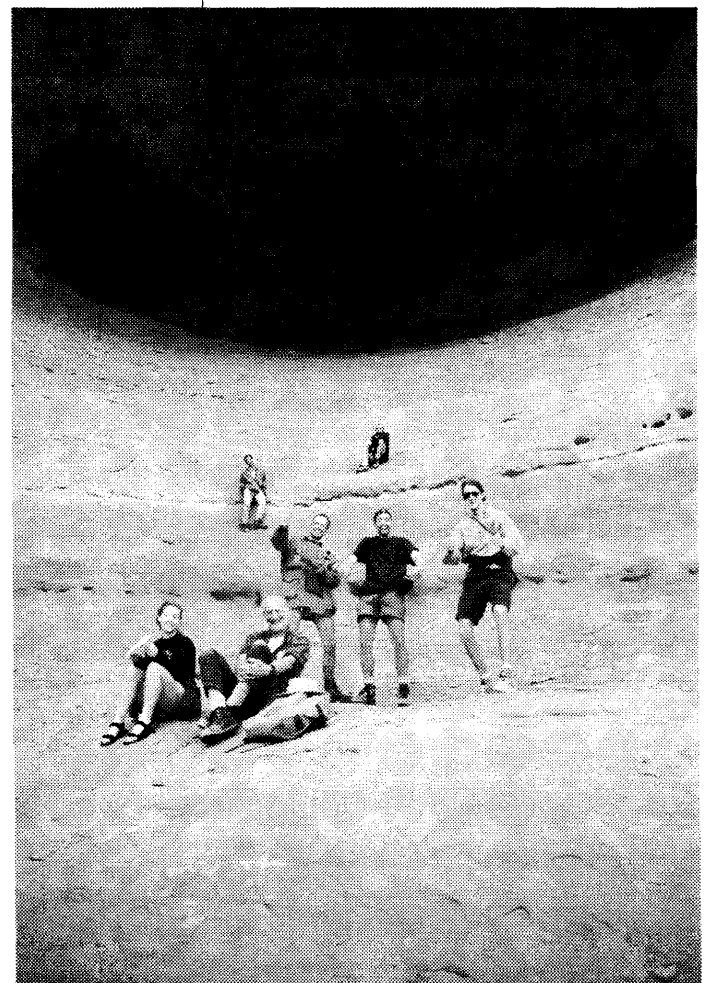
I am very pleased that you maintain this program. Some students have a difficult time finding the money to pay for trips of this sort. Your help makes it possible for more students to participate in these kind of activities.

— Garry G. Anderson, Professor and Chair, Department of Earth Sciences, St. Cloud State University.

### University of Minnesota - Utah

Thanks once again for the scholarship for our Utah field trip.

The trip was a great success. We started at Colorado National Monument near Grand Junction, looking at pediments and at Unaweep Canyon, a well-known example of superposition (or is it antecedence) and stream capture. The second day saw us in Fisher Valley which is one of several subparallel valleys formed by collapse of anticlines when groundwater dissolved the underlying Paradox Salt in the cores of the anticlines. Thence, we visited a rock glacier in the La Sal Mountains, and explored Arches National Park with a recent GSA Bulletin article on formation of



## Spring Geology Field Trips, cont.

have resulted in a more realistic pattern, but that would have been beyond the scope of the project.

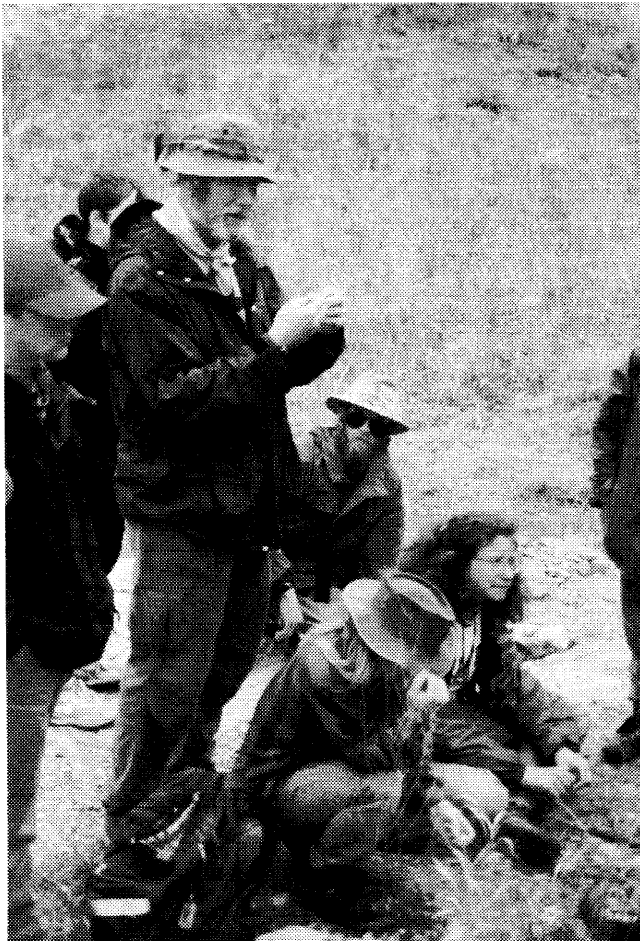
—Roger LeB. Hooke, Professor, Department of Geology and Geophysics, University of Minnesota.

### Carleton College - Wisconsin/Iowa

Here is a picture from the spring field trip to Wisconsin and Iowa — it's Ed Buchwald giving a spontaneous talk about fossil preservation near MacGregor, Iowa. Eighteen students went on the trip with four staff people.

Thanks for the support.

— Timothy Vick, Professor, Department of Geology, Carleton College



## CDC/MDH Midwest Water Quality Study

During 1994, the Minnesota Department of Health (MDH) participated with the Centers for Disease Control and Prevention (CDC) and eight other midwest states in a private well water quality study. CDC funded the study to gather background water quality data on private wells in states most affected by the 1993 floods.

A grid divided into 10-mile squares was placed over the entire nine-state area of Minnesota, Iowa, Wisconsin, North and South Dakota, Nebraska, Kansas, Illinois, and Missouri. One well near the center of each 10-mile square tract of land was selected for sampling. Well construction information and health data were collected. In Minnesota, 872 wells were selected for the study. Water samples collected were analyzed for total coli-

form bacteria and fecal coliform bacteria, nitrate, and atrazine. In Minnesota, water samples were also analyzed for arsenic.

A summary report of the data is being prepared. Early results indicate that:

- Twenty five percent of the wells tested in Minnesota were positive for total coliform bacteria. The regional average for total coliform was 45 percent. Fecal coliform bacteria was detected in 4.5 percent of the wells tested in Minnesota.
- Approximately 6.8 percent of the wells tested in Minnesota exceeded the Health Risk Limit of 10 mg/l for Nitrate as Nitrogen.
- Six percent of the wells tested in Minnesota had levels of atrazine above the detection limit of 0.015 ug/l. None of the samples exceeded the Health Risk Limit of 20 ug/l.

## 1995 Legislative Summary

This summary covers laws pertaining to waste, ground water and related issues that were enacted during the 1995 Minnesota legislative session. We have tried to provide you with as much information as possible in this summary. If you need additional information about any of these bills, please contact staff that are listed.

### Environmental Appropriations for FY96-97

#### Ground Water Monitoring and Assessment

- The Legislature allocated \$867,000 to the MPCA for the next biennium to fund:

Monitoring and assessment of statewide ground-water-quality trends in areas where ground water is vulner-

—continued on page 6

### Midwest Water Quality, cont.

- Fifty-five percent of the wells tested in Minnesota had detectable levels of arsenic. Only 0.4 percent exceeded the current federal drinking water standard of 0.05 mg/l.

During the summer and fall of 1995, the MDH will sample selected wells for additional information. The well water will be analyzed for bacteria and nitrate. The survey will sample 10 percent of all wells sampled in the Phase I survey, and in addition, sample all wells that tested positive for coliform bacteria and nitrate. A sample of untreated water (i.e., unfiltered, nonsoftened) tap water will be collected from a regularly used, non-swung faucet within the house. The well owner will be given a copy of the results of the water analysis. While information gathered is public record, well owner names and locations will not be identified in any published reports. After this second round of sampling is completed no further testing is planned.

If you have any questions, please contact Mr. James Nye, Minnesota Department of Health, P.O. Box 64975, St. Paul, Minnesota 55164-0975, at (612)215-0811.

## 1995 Legislative Update, cont.

able due to land uses and geology.

- Acceleration of the statewide assessment of baseline ground water quality in Minnesota's 14 principal aquifers.
- Investigation of unique ground-water-quality problems and regional monitoring in conjunction with local governments.

### Amendments to the Ground Water Protection Act

- Require increased analysis of trends in water quality and quantity in biennial reports submitted by the Environmental Quality Board, the Minnesota Pollution Control Agency (MPCA), the Minnesota Department of Agriculture (MDA), and the Department of Natural Resources (DNR).
- Require the MDA and MPCA to monitor the use and effectiveness of agricultural and other best management practices through field audits and other appropriate means.
- Allow the Board of Water and Soil Resources approve requests of more than \$2,000 to seal high-priority wells.

### Metropolitan Area Ground Water Model to Predict Contaminant Movement

This law provides \$250,000 to the MPCA to enhance ground-water protection in the seven county Twin Cities metropolitan area by:

- Developing an interactive, multi-layer computer model of ground-water movement in principal aquifers beneath the seven-county area.
- Testing and applying the model to sites of ground-water contamination.

For information, contact Andrew Streit, MPCA, at (612)296-7791.

### Conservation Officers and Solid Waste Tickets

This law provides the DNR with \$100,000 per year to fund solid-waste ticketing activities.

## Regional Landfill Cleanup Program Staff

One year ago, the Minnesota Legislature established the Landfill Cleanup Program, designed to change the way the state cleans up and takes care of closed landfills. To help implement this program, the 1995 Legislature funded two full-time staff in regional locations. These staff will be responsible for inspections and construction review at closed landfills. The new positions will also offer local officials and citizens easier access to the cleanup program and more rapid response to emergency situations that may occur at the landfills. For more information on the program or the regional staff positions, contact Doug Day, MPCA, at (612)297-1780.

— from *MPCA's Ground Water & Solid Waste Connection*, June 1995, Scott Hvidsten, Editor

## Fall field trip and conference

As this issue goes to press, many of you are anticipating the fall field trip to the Minnesota Iron Range, September 8-9, co-sponsored by the American Institute of Professional Geologists (AIPG) Minnesota Chapter, the Mesabi Range Geological Society (MRGS) and the Minnesota Ground Water Association. Field trip stops will include the Peter Mitchell Mine at Babbitt, the inactive Embarrass Mine, and a tour of the Tower-Soudan Underground State Park. A full report will appear in the December newsletter. Also coming up is the MGWA fall conference. This year the conference will be a full day seminar on **Use of Isotopes in Hydrology**. The featured speaker will be isotope hydrologist Carol Kendall of the U. S. Geological Survey in Menlo Park, CA. A portion of the day will be devoted to short reports from Minnesota isotope researchers describing their work. Although the final agenda has yet to be established, be sure to mark October 27 at the Earle Brown Center on your calendar. Registration will be limited! Watch for a registration form to come by mail later in September.

## New Publication from USGS

*Water Level Declines from 1980-1990 in Major Aquifers in the Twin Cities Area*, by William J. Andrews, Lee C. Trotta, and Michael E. Schoenberg. This is a report prepared for the American Water Resources Association (AWRA) Conference in Houston, TX, November 5-9, 1995. From 1980-1990, ground water withdrawals in the Twin Cities Metropolitan Area in Minnesota increased from about 200 to 324 million gallons per day. Pumpage from the Prairie du Chien-Jordan and the Mount Simon-Hinckley aquifers is quantified in this report and water level declines over this period (2 and 43 feet, respectively) are evaluated.

## 40th Annual Midwest Ground Water Conference

Columbia, Missouri, Ramada Inn, October 16-18, 1995.

Sponsoring agencies: Missouri Department of Natural Resources, Missouri Ground Water Association, University of Missouri-Rolla, US Environmental Protection Agency - Region VII, US Geological Survey.

Session topics include:

- Regional Geohydrology/Aquifer Evaluation
  - Water Quality/Geochemistry
  - Agricultural Contamination
  - Groundwater Management
  - Computer Applications
  - Legal/Policy Issues
  - Groundwater Recharge
  - Geophysical Applications
  - Groundwater Education/Planning
- For further information; Don Miller, Missouri Department of Natural Resources, Division of Geology and Land Survey, PO Box, Rolla, MO 65401-0250. Phone (314)368-2192; FAX (314)368-2111.

## One Stop For USGS Water Data

The U.S. Geological Survey's (USGS) Water Resources Division (WRD) is in the process of redesigning and implementing a new data base, the National Water Information System-II (NWIS-II). NWIS-II is a highly flexible data-management and processing system which will serve as a clearinghouse of hydrologic and related data compiled both by WRD and other local, State, and Federal agencies. The data base will contain stream-discharge, water-use, water-quality, ground-water, sediment, climate, and biologic data, with an index of data and sources. NWIS-II will replace the following data bases: GWSI (ground water), ADAPS (surface water), QWDATA (water quality), WUDS (water use), WATSTORE (National Water Data Storage and Retrieval System) and NAWDEX (index to Federal water data). NWIS-II will be used to integrate disciplines of water data, easily retrieve data, and transfer data to many types of software. Topographic and other thematic information will be available to aid data entry, retrieval and analysis. Users will be able to apply spreadsheet and statistical-analysis software (including ground-water models) to produce customized output and graphs for this newly expanded range of water data.

The data base will reside on 50 or more servers located at WRD offices (figure 1). The local WRD office is in Mounds View, Minnesota, and is connected to all other servers in a Distributed Information System (which uses LAN-WAN links to a Department of Interior network backbone). The decentralized structure of NWIS-II will enable users to manage, search, and transfer data swiftly.

Data may be retrieved with a variety of functional tools. A graphical interface, a Geographic Information System interface, and a command-line interface will be available to select the geographic area of interest for data retrieval. An intuitive, graphical interface, that makes extensive use of system reference lists and user-preference files, will allow most users of the system to use a mouse to make selections from pulldown and pop-up menus.

Figure 1. -- Location of the WRD offices in the Distributed Information System

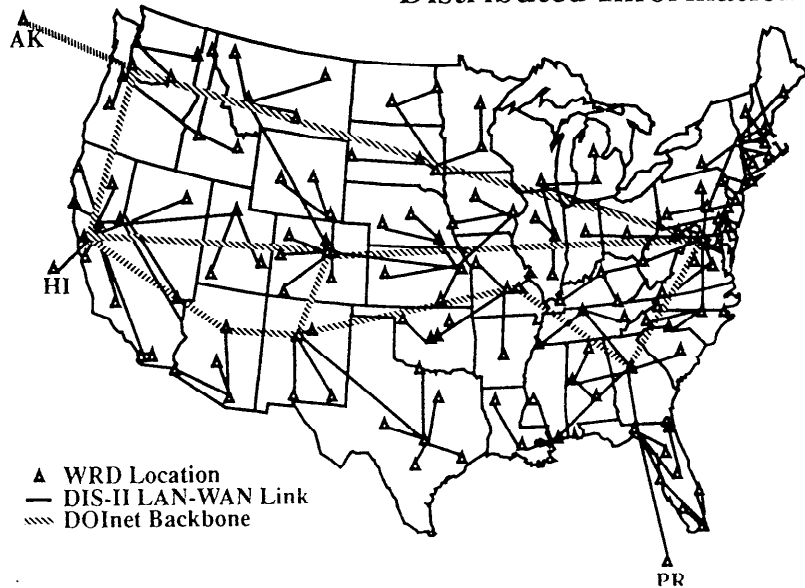
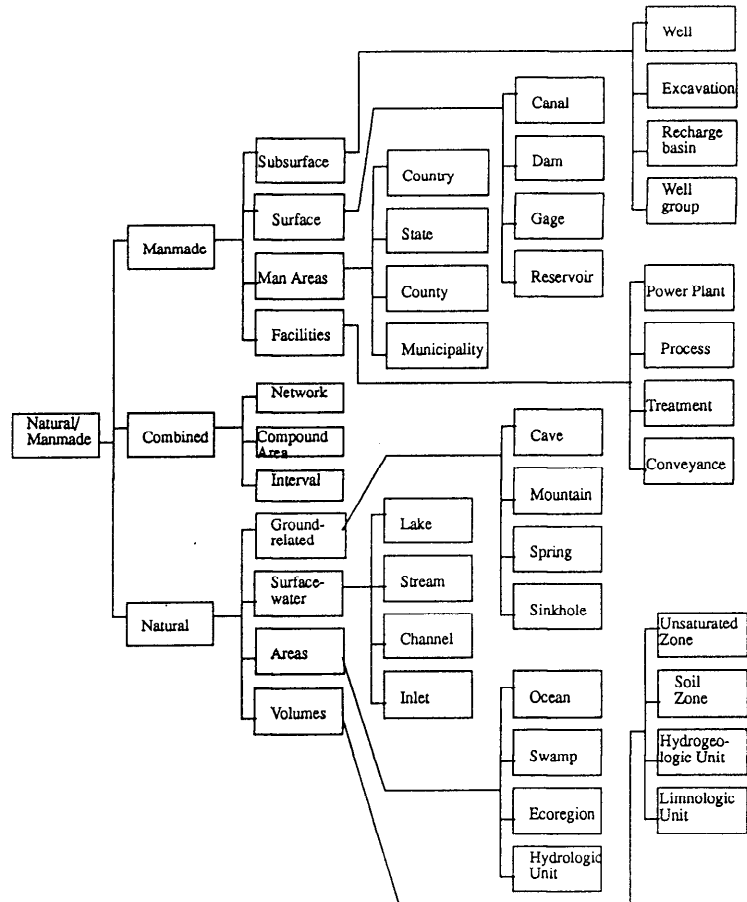


Figure 2. Natural/Manmade Features Pathway in NWIS-II



## One Stop Data at USGS, cont.

What is there to be retrieved? The USGS collects water information at common features such as wells, streams, aquifers, and lakes. The user can retrieve all data associated with such a feature by choosing the output option and navigating through the menus to the desired feature. The output option is customized with user-preference files to several retrieval approaches (spatial, water-budget, natural/manmade, and cooperator). A simplification of the natural/man-made approach is shown in Figure 2 to illustrate the types of features available for selection. This set of criteria for selecting data is based on whether the data describe a manmade object, such as a well, or whether the data describe a natural feature, such as a spring. An example retrieval of point data might lead down the pathway from "manmade" to "sub-surface" to the "well" feature. A retrieval of line data might go from "natural" to "surface water" to "stream". Each retrieval approach may lead to any of about 840 tables plus reference lists and about 4670 attributes or columns in tables (Charles F. Merk, U.S. Geological Survey, 1995, written commun.).

Once features of interest have been chosen, users then have several mechanisms through which they can select sites. One mechanism will be selection by drawing a polygon with a mouse on a screen display of the State map (an example use of the Geographic Information System interface); another mechanism will be entry of site identification numbers on the command line. The area of interest may be local or may be polled from across the country.

Once data to be retrieved have been selected, the user may choose any of several formats for output. These include standardized reports, manuscripts, export files, graphs, or map plots.

NWIS-II will provide quick and easy access to current data (such as streamflow and gage-height values) denoted as provisional. There will be limited access to other NWIS-II data prior to approval and release by the U.S. Geological Survey. The most substantial access will be given on a case-by-case basis to agencies with which the USGS has a cooperative funding agreement. Knowledge of NWIS-II capabilities could reduce duplication of effort in software development for cooperating agencies. NWIS -II will use two approaches to cooperator access (C. F. Merk, WRD Headquarters, 1994, written

commun.). Full access by a cooperating agency will use the window-based software mounted on a Data General<sup>1</sup> workstation in the user's office or will link to the District NWIS-II server with an X-terminal. Cooperators who access USGS data bases occasionally or do the same retrieval repeatedly, should use the cooperator interface. This interface will enable users with vt100 terminals and PCs to access NWIS-II, enter retrieval criteria, and request a listing of report-format options.

The general public also will be able to access NWIS-II data that has been approved and released by the U.S. Geological Survey via the Internet connection to the USGS WRD Minnesota District Home Page. Although access policies and security measures may change this, it is anticipated that viewing and copying will be the only functions available to the general public. Organizations that have water-related information appropriate for addition to NWIS-II or questions about NWIS-II may contact Lee Trotta, WRD, Mounds View, Minnesota at (612)783-3240.

<sup>1</sup> *The use of trade or firm names in this article is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.*

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## Join the Minnesota Ground Water Association!

If you are reading this newsletter second-hand, we'd like to take this opportunity to invite you to become a member of **MGWA** for 1995. Annual dues are \$15 for professional members and \$10 for students. Additional donations toward the use of recycled paper will be gratefully accepted.

Just complete the form below and mail to: MGWA, c/o WRI, 4779 126th St. N, White Bear Lake, MN 55110-5910.

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## Minnesota Water Line Expands

The Minnesota Water Line, (MGWA Newsletter; June 1995), a cooperative effort of the Minnesota Extension Service and the American Ground Water Trust, is expanding its service area to include the entire state of Minnesota.

A pilot project in eleven north-eastern counties has been in operation since April, 1995. Expansion of service to all of Minnesota is planned to occur in November, 1995.

Funding is still needed, however, to match grants and keep the Water Line open. Please contact Deanne Roquet, Water Line Coordinator, at (218)726-7524 to suggest funding opportunities, or to volunteer as a Water Line Professional.

The Minnesota Water Line is a unique partnership that links the experience and expertise of the University of Minnesota land grant institution, with professionals in consulting, contracting, research and high-tech industries from communities throughout Minnesota. A toll-

free phone line (800)455-4526 connects citizens and decision-makers throughout Minnesota who have a concern about a water issue to professionals who have no financial or political interest in their concern.

The professionals provide technical information, suggest alternatives and consequences for action, make appropriate referrals, and encourage and assist callers to seek and evaluate information.

## Ground Water Users Guide being Developed

The MPCA, in conjunction with several other state agencies, is developing a new user's guide to answer commonly-asked questions about ground water in Minnesota.

The purpose of this new guide is to provide citizens with an easy-to-use guide to direct them to the right government agency regarding various ground water issues, such as well sealing, wellhead protection rules, large-volume ground water use and drainfield regulations.

This guide is aimed at reducing the confusion and frustration citizens sometimes feel when looking for answers to their ground water questions.

The new publication is scheduled for distribution sometime in the early fall of 1995. For more information on this guide, contact Elizabeth Gelbmann, MPCA, at (612)296-7753.

## Note from the Advertising Editor

Jan Falteisek, your Advertising Editor for this newsletter, notes that fees for several of our advertisers are due for renewal. If you are uncertain of when your subscription expires, or for other questions on advertising orders, rates and policy, contact Jan at Minnesota DNR, Waters Division, 500 Lafayette Road, St. Paul, MN 55155, Phone: (612)297-3877, Fax: (612)296-0445, E-mail: jan.falteisek@dnr.state.mn.us.

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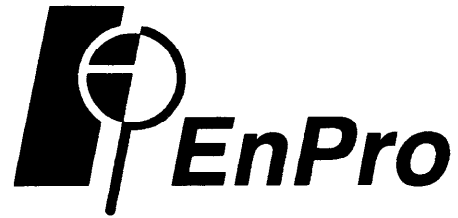
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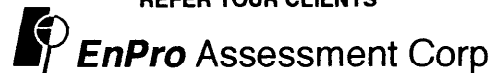
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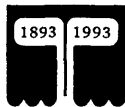
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