



GEOLOGICAL SOCIETY OF MINNESOTA

NEWS

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WELCOME NEW MEMBERS

Dennis Berndt
Michael Berndt
Michael Goater
Richard Moskop
William Bruce Nelson
Morgan Tamsky

Minnesota Geological Survey Information Systems

The Minnesota Geological Survey is conducting a systematic enhancement of web-accessible information systems, including an up-to-date database of every publication released since 1872; searchable page scans of every publication released since 1872, total 40,000 pages; web accessible rasters of every map released since 1872, total 600 maps; enhancements of curation and cataloging of collections and databases such as heavily-used drillhole databases; major enhancements of state magnetic, gravity, and rock property databases; compilation of a state geochemical database; multi-layered new state geologic map; compilation of web-optimized detailed geologic mapping layers; enhancement of quantitative specification of material properties of groundwater systems, such as hydrogeologic properties; and, most importantly, acceleration and enhancement of the core MGS program, multi-layered County Geologic Atlases.

An up-to-date database of every publication released since 1872: Databases of MGS publications previously maintained in multiple and varying formats are being consolidated as a comprehensive master, and plans call for enhanced arrangements for submission of updates to USGS, Georef, and elsewhere.

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Upcoming Event of Interest

The official opening of the Harmony Karst Interpretive Site is Saturday, June 6th. A sinkhole was purchased by the Harmony Area Historical Society a few years back and has been developed into a geological interpretive site with assistance and input from the Soil and Water Conservation District, the MN DNR Dept. of Trails and Waterways plus many others. The site is situated along the Harmony-Preston State Bike Trail and is being donated to the DNR. Interpretive signs are in their final states of production and will be permanently displayed at the site. Anyone interested in Karst may want to attend our "Sinkhole Saturday." See the GSM website for more information (when it becomes available.)

GSM NEWS

Editor: Judy Hamilton
Production Mgr: Katy Paul

Geological Society of Minnesota is a 501(c)3 nonprofit organization. The purpose of this newsletter is to inform members and friends of the activities of the Geological Society of Minnesota. GSM NEWS is published four times a year: **February 15, May 15, August 15, and November 15.** GSM NEWS welcomes unsolicited Geology and Earth Science related articles and photographs. Deadline for article submission is the first of the month, before the date of publication. Send all material for GSM NEWS to the address below.

OFFICERS:

Ly Preece, *President*
Dick Bottenberg, *Vice President*
Ed Steffner, *Treasurer*
Gerry Paul, *Secretary*

Directors in addition to the officers listed above: Kathy Ahlers; Kate Hintz; Sandy Steffner; Harvey Thorlielson; one vacancy.

Send all GSM membership dues, change of address cards, and renewals to:

GSM Membership Chair
P.O. Box 390555
Edina MN 55439-0555

Membership levels are \$10 Full-Time Students; \$20 Individuals; \$30 Families

Upcoming Field Trips

Trip No. 1 to Lilydale (the brick yards) was held May 16, before this issue of the newsletter was published. Watch for pictures and other information on that trip in the August newsletter.

Trip No. 2

Barn Bluff, Red Wing, Minnesota, Julie Maxson, Assistant Professor of Geology and Randy Strobel, Associate Professor of Biology, both from Metropolitan State University in St. Paul, **Saturday, May 30** (Sunday May 31 is also a possibility). This will be observance of late Cambrian and early Ordovician sedimentary rocks and their sedimentary structures. Observe a dip-slip fault with 150 feet of displacement on Barn Bluff. Discuss the glacial and post-glacial evolution of the Red Wing landscape. A guided tour of the Goodhue County Historical Museum will also be included. The trip will conclude with a 2.2 mile roundtrip hike to the top of Barn Bluff to get a breathtaking view of the Mississippi River Valley.

Contact: Randy.Strobel@metrostate.edu.

Trip No. 3

Minnesota River Watersheds, South Central Minnesota. A two day trip, **Saturday July 18 and Sunday July 19.** Carrie Jennings, Senior Scientist, Minnesota Geological Survey will lead this trip. Travel by bus, with significant hiking, canoeing and choice of camping or motel.

Day 1 is a trip down the Minnesota River to Seven Mile Creek County Park near St. Peter. Hiking will be trails to investigate the glacial and bedrock exposure, river history and the current concern over the turbidity impairments in the stream will be introduced. Will travel to Quarry Lake Park in North Mankato for canoeing in still water.

Day 2 will explore the Le Sueur River watershed, south of Mankato. By canoeing the Le Sueur from upstream of the confluence with the Maple to near the confluence with the Blue Earth we will see over a million years worth of glacial units exposed in the bluffs as well as the top of the weathered bedrock. This plan is subject to revision depending on the stage of the river at the time of the trip.

Contact: Organizer, Bill Robbins at 651-739-1146 or robbins.wb@comcast.net for further information

Searchable page scans of every publication released since 1872, total 40,000 pages: Since 1872, MGS has published 40,000 pages of publications. These were scanned as one batch with support from University of Minnesota Libraries. PDF files with searchable OCR content will be web accessible in 2009, and digital books will be made available as soon as format evolution stabilizes. Folded inserts are being made available as separate items, while bound foldouts will be included in the PDF files and digital books.

Web accessible rasters of every map released since 1872, total 600 maps: Since 1872, MGS has published 600 maps. These were scanned as one batch with support from University of Minnesota Libraries. Jpg files are now web accessible, and PDF files will be added in 2009. There will be ongoing effort to optimize searchable OCR content. Folded inserts from reports are included among these maps.

Enhancements of curation and cataloging of collections and databases such as heavily-used drillhole databases: MGS collections include hand samples, thin sections, sediment samples, geochemical samples, and cuttings. MGS contributes to the DNR drill core library and mineral exploration file archive, and the University paleontological archive. MGS databases include field notebooks, geological mapping data, karst database, sediment textural and lithological data, geochemical data, aeromagnetic database, gravity database, rock properties database, borehole geophysical logs, the water well database that MGS co-manages with the Minnesota Department of Health (MDH), and geotechnical data. Materials and data are well stored, although document collections are vulnerable to disaster. Needed actions include enhanced cataloging, scanning, more consistent and interoperable database structures, and improved web accessibility.

Major enhancements of state magnetic, gravity, and rock property databases: In 2007, the Minnesota aeromagnetic database was reprocessed to recover line data missing from the primary digital archive, to mitigate line-leveling errors that locally caused striping artifacts, and to use the revised data to produce a higher-resolution aeromagnetic grid for the entire state, resulting in a much-enhanced ability to resolve features. In ~2010, pending confirmation of funding, the 58,000-site gravity database will similarly be improved by enhancing station location precision. In addition, the rock property database that provides density, magnetic susceptibility, and other data used to link geophysical surveys and geologic mapping will be enhanced by enabling vertical georeferencing and thus 3D and drillhole analyses.

Compilation of a state geochemical database: The need for documented statewide geochemical information is escalating, as exploration geochemical surveys need a reference on regional context, project permitting requires documentation of current conditions, and cleanup efforts require information about existing background levels of contaminants to indicate how clean is clean. MGS therefore is working with USGS and the MN Pollution Control Agency to assemble and map statewide, consistent, standardized, and documented geochemical data for soil, soil parent material, and groundwater in selected aquifers.

Multi-layered new state geologic map: Having conducted much new geologic mapping since the last update in 2000, and having reprocessed the aeromagnetic database, a new State Geologic Map will be produced in 2009, with removable layers for water, Quaternary, Mesozoic, Paleozoic, and four late Precambrian units, over Archean and other basement rocks. New themes will include diabase dikes and metamorphic grade.

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Compilation of web-optimized detailed geologic mapping layers: Mapping at 1:100,000 and 1:24,000 is required at the county scale. Paper maps are still required, although users rely on the web to obtain information they need to do their jobs. Standard geologic maps with intricate legends, obtained by time-consuming download, are not the optimal basis for swift web queries, although these maps will remain the authored, peer-reviewed foundation of our system. New detailed geologic map layers, optimized for efficient web query, therefore are needed for optimal web accessibility, while also acting as a gateway to the more thorough documentation in standard maps and reports. Web-accessible mosaics of existing detailed surficial and bedrock geologic maps therefore will be prepared in 2010, initially as an Open Geospatial Consortium Web Map Service, with plans for gradual harmonization.

Enhancement of quantitative specification of material properties such as hydrogeologic properties: Regional hydrogeological characterization of groundwater systems is an ongoing high priority activity. Increased effort is going toward quantitative characterization of the most heavily used aquifers, based on compilation and interpretation of a large volume of hydrostratigraphic and hydraulic data. The result is a hydrogeologic framework that can be used to formulate more effective ground-water management strategies, and in particular to improve our ability to predict aquifer productivity and contaminant transport paths.

Acceleration and enhancement of the core MGS program, multi-layered County Geologic Atlases: Minnesota Geological Survey is steadily increasing the focus of all activity on the County Geologic Atlas program. These sets of 1:100,000 maps include bedrock geology, surficial geology, bedrock topography, depth-to-bedrock, and subsurface geology. The Atlases have become progressively more digital and 3D, and one of the early atlases from the 1980s has now been updated as a result of financial support from the County. The Minnesota Legislature has committed itself to enhanced groundwater protection, and the County Geologic Atlas program is seen as a key to fulfillment of this objective.

Submitted by : Harvey Thorleifson Ph.D., P.Geo., D.Sc., Director, Minnesota Geological Survey; State Geologist of Minnesota; Professor, Department of Geology and Geophysics; University of Minnesota; 2642 University Ave W, St Paul, MN 55114-1057 USA; Telephone 612-627-4780 ext 224; Fax 612-627-4778; thorleif@umn.edu

IN MEMORIAM

Dode Wonson (Ethel Irene Hamilton Wonson), a longtime member of the Minnesota Geological Society, passed away on April 28, 2009. Born in Minneapolis April 26, 1920, she was raised on the family homestead in the Interlachen Park neighborhood of Hopkins. She graduated from Hopkins High School in 1938, and then attended Carleton College, where she received a Bachelor's Degree in Geology in 1942. As she noted on many occasions, a woman with a college degree at that time could be a teacher, nurse or secretary. So she joined the Blake School as secretary to the Headmaster. There she meet her husband Harold "Chief" Wonson and was married in 1943.

The next 25 years she raised her three children and participated in many community activities. Dode was someone for whom service to the community was a privilege. The list of her many memberships and activities is too long to list here, but among them, she was a 65-year member of American Association of University Women. She not only served in leadership positions but made regular visits to shut-in acquaintances and knit hundreds of hats and mittens for children. She could often be seen in the back row at meetings doing her knitting. She was a longtime member in the GSM and could be seen many times over the years as a worker at the Minnesota State Fair booth.

GIANT TRILOBITES

Giant trilobites have been discovered in a rock quarry in northern Portugal.

The finding, published in the journal *Geology*, adds a new chapter to the story of some of the most successful creatures that ever lived, and may even challenge current specimens for the largest the planet has ever seen.

The current record holder for the largest trilobite still officially stands at the 72 centimeter (28.3 inch)-long *Isotelus rex*, a fossil recovered in Manitoba, Canada in the year 2000.

Last year, Artur Sa of the University of Tras-os-Montes and Alto Douro and a team of colleagues unearthed a slew of similar giants between 50 and 70 centimeters (19.7 and 27.6 inches) long in a slate quarry in Arouca, Portugal.

They also found two fossilized tail sections which they believe belonged to 90 centimeter (35.4 inch)-long animals, the biggest in the world.

"Normally trilobites in the Iberian Peninsula and throughout Spain don't get bigger than 10 centimeters (3.9 inches) long," Sa said. "In the quarry, they are normally above 30 centimeters in length."

In their heyday, more than ten thousand known species of trilobites blanketed the seas. They drifted in the water column, and crawled on the ocean floor like horseshoe crabs, their modern day descendants. Throughout their 300-million-year stay on the ancient earth, adults generally grew to between 2 and 5 centimeters (0.8 and 2.0 inches) long.

But some ballooned to almost a meter long, and scientists are at a loss to explain why.

"We did a lot of speculation when we found the *Isoletus rex* specimen," David Rudkin of the Royal Ontario Museum said. "The part of Canada where they were discovered was in the tropics during the Ordovician period. We thought it could have something to do with large nutrient supply, or high productivity in tropical waters. But these new ones are very different."

The largest Portuguese fossils, *Ogyginus forteyi* and *Hungioides bohemicus* lived 465 million years ago, in a shallow ocean near the South Pole. Sa speculates that the cool waters might have been oxygen-deprived, and the creatures immense size allowed them to slow their metabolisms.

"It's like King Crabs today," he said. "Polar gigantism is common among modern marine arthropods."

The rocks of Arouca also reveal trilobites as social beasts; clusters of hundreds to thousands of animals are common. Sa believes they congregated as protection during molting when their shells were soft and vulnerable to predators. They also appear to have gathered as an efficient way to mate with one another.

Submitted by Katy Paul

**Minnesota State Fair
August 27 – September 7, 2009**

In the next couple of months, the Show and Exhibit Committee will be putting together a list of workers for the State Fair booth. We will need 72 people, each to work a 4-hour shift at the booth. (More shifts if you have the time and are so inclined.) Each day is divided into three shifts, 9 a.m. to 1 p.m., 1 p.m. to 5 p.m., and 5 p.m. to 9 p.m.. Two people are required (by the State Fair Administration) for each shift. The booth cannot be unattended during the open hours of the Fair.

You don't need to be a geologist to staff the booth. You just need to hand out brochures, smile and maybe talk about the rocks and fossils on the table. People will like to talk to you about their special found treasures also. The children are especially excited about the rocks in the display. Books are on the table and photographs (usually of field trips) on the backdrop

Even though there are several months before the Fair starts, look at your calendar and decide what days work for you. You can also talk to your buddy(s) and friend(s) to see if they want to work with you.

It's really a fun experience and a good way for folks to find out about us.



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