Minnesota Geological Survey

NEWSLETTER Summer 1993

From the Director

One of the tedious parts of the Academy Award ceremonies every year comes when the director gets up and thanks fifty people for making it all possible. Now that I am leaving MGS, I have been thinking about all the people I need to thank for making MGS a success. If I were to list everyone, you would turn the page, if you haven't done so already. I would begin my list with George Shaw and Matt Walton, who encouraged me to try for the job back in 1986; continue with our management team, G.B. Morey and Dave Southwick, who push us all to achieve higher standards; and come right up to date with the four fine employees I just had to lay off due to our state budget cuts. They handled the bad news with far more grace and professionalism than I ever could have, and I recommend all of them to those of you with employment openings.

Some of the things we did plan to achieve back in the "Commitment to Focus" days of 1986-1987 have come true: (1) mainstreaming MGS's geophysics program under Val Chandler (previously funded from the state cigarette tax), (2) expanding MGS's staffing for Quaternary geology, (3) increasing the number of women scientists at MGS—six of our eleven new scientist hires have been women, and (4) replacing some of MGS's classic but aging field vehicles—including "Rambo" with 273,200 miles, the 1977 Dodge pickup we bought in 1986 from the Department of Agriculture in Grand Rapids, who in turn had bought it from the Marine Corps (honest). In particular, we have greatly expanded our computer capabilities, through the acquisition of additional personal computers and workstations, and through major advances in staff capabilities for using geographic

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Grew to Move to the University of Nebraska-Lincoln

Priscilla Grew, director of MGS, has accepted the position of Vice Chancellor for Research at the University of Nebraska-Lincoln. She will leave MGS for Lincoln in September 1993. At the University of Nebraska-Lincoln she will hold joint appointments in the Department of Geology and the Conservation and Survey Division of the Institute of Agriculture and Natural Resources. She will oversee all research activity, the Office of Grants and Contracts, patent and technology transfer, Institutional Animal Care, the Experimental Program to Stimulate Competitive Research, interdisciplinary research centers, the University of Nebraska State Museum, the University of Nebraska Press, the Whittier facility, and other research support programs.

Grew has been Director of MGS since 1986. From 1981 to 1986, she was commissioner of the California Public Utilities Commission. From 1977 to 1981, she was director of the Department of Conservation for the State of California, and from 1972 to 1977 she was a research geologist at the Institute of Geophysics and Planetary Physics at the University of California, Los Angeles.

A search is underway to fill the position of interim director from within the ranks of MGS. The interim director will serve for one year, from September 1, 1993, while a nationwide search for a permanent director is held.

Institute on Lake Superior Geology Meeting

MGS, with cooperation from the Minerals Division of DNR and the Mesabi Range Geological Society, hosted the thirty-ninth annual meeting of the Institute on Lake Superior Geology in Eveleth, Minnesota, on May 5-8, 1993. MGS assistant director Dave Southwick was the general chair. MGS staff members Val Chandler, Jane Cleland, Mark Jirsa, and James Miller made oral presentations; and Terry Boerboom, Peter McSwiggen, and Anthony Runkel presented posters. A field trip to several taconite operations along the eastern end of the range, sponsored by the Mesabi Range Geological Society, was the first major geologic field trip on the range since 1972. MGS staff led two other field trips. Mark Jirsa, Terry Boerboom, and Peter McSwiggen led a trip through the recently mapped Archean greenstone-granite terrane of the Cook to Side Lake area. Jim Miller and Val Chandler led a trip to Duluth to examine the type section of the Middle Proterozoic.

Members of the Mesabi Range Geological Society produced a new geologic map of the range, the first since 1956. Segments of the map were prepared by geologists from several mining companies and compiled into a seamless map on a 1 inch equals 1 mile base provided by the Minnesota Department of Natural Resources, Minerals Division (DNR). Dave G. Meineke (Meridan Engineering, Hibbing, Minnesota) supervised the compilation, with the assistance of Richard C. Bucheit (Eveleth Fee Office, Eveleth, Minnesota), E. Henk Dahlberg and LeRoy E. Warren (DNR, Hibbing), and G.B. Morey (MGS, St. Paul). MGS supervised the cartography and printing. The eight-color map shows many of the major structural attributes associated with the Mesabi range, the locations of natural-ore and taconite mines along the range, and the general location of copper-nickel and titaniferous magnetite deposits or prospects in the Duluth Complex to the southeast of the range. The map will be available to the public soon from the Mesabi Range Geological Society.

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information systems. MGS can now produce multi-color maps using these systems.

Among the many things I never anticipated when I took the job were: (1) being able to get $800,000 for geologic mapping from the proceeds of the state lottery, (2) receiving a morning phone call from the Dean saying that our entire budget had been vetoed and would be zero in twelve months unless I did something about it, (3) having two undergraduate students who were working late save the Survey from a major flood when a water pipe broke on the Sunday night of Christmas weekend, (4) seeing our budget increase to an unprecedented $4.5 million this past biennium, and (5) having to have a muskrat removed from the premises (see story elsewhere in this issue).

A major problem now facing MGS is our increased dependence on external "soft money" funding. Since program growth could not come through the University State Special Appropriation, about 52 percent of our total funding now comes from local, state, and federal contracts. Many state and national geological surveys are now in this situation. While these projects keep us on our toes, making us responsive to state and local needs for earth sciences information, they also subject us to a great deal of volatility in our budget. For example, for the next biennium, the Legislative Commission on Minnesota Resources unexpectedly decided to recommend a 47 percent cut in MGS funding from the Environment and Natural Resources Trust Fund (lottery proceeds) for the county geologic atlas and regional hydrogeologic assessments. This budget reduction, combined with a major cut in the Minnesota Mineral Diversification funding, has put us in the first layoff situation at MGS since 1983.

I would like to ask all of the friends of MGS to do what you can to help us to remain an outstanding unit of the University of Minnesota, participating fully in the land-grant mission of teaching, research, and service. MGS has greatly benefited from the professional advice we have received in recent years from the private sector, state and local agencies, and our national and international scientific colleagues, particularly those in Canada. We have been especially grateful for the enthusiastic participation in our workshops on geophysics, Quaternary mapping, gold and platinum mineral deposit models, and industrial minerals. The outpouring of community support that saved us from abolition in 1992 was a great morale boost for the entire staff. The employees of MGS continue to need your support as they work for the citizens of the state and educate students at the University. It has been a great honor for me to be associated for almost seven years with one of the top state geological surveys in the nation.

Priscilla C. Grew

Four MGS Employees Laid Off

Due to budget cuts, four MGS employees will be laid off at the end of June. They are Dick Christopher, Tanda Gretz, Ann Rae Jonas, and Reed S. Wold.

Tanda Gretz has done data entry at MGS for almost a year and hopes to find other work within the university. Only five classes away from her bachelor's degree in English, she is considering an eventual move into editing.

Ann Rae Jonas has been an editor at MGS since March 1992. She has a master's degree in science writing. Prior to coming to MGS she edited a popular-level astronomy magazine at the University of Texas. She would like to find steady free-lance work.

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Editor: Ann Rae Jonas

Minnesota Geological Survey
2642 University Ave.
St. Paul, MN 55114-1057
(612) 627-4780

Reed Wold, who has done database maintenance at MGS for six months, has over twelve years of experience in systems management, documentation, and customer relations. In his spare time he coaches volleyball, soccer, baseball, and softball (his son plays baseball and his two daughters play softball). His goals include finding another job, getting to the cabin more than once this summer, and being a better father and husband.

Editor's note: When I asked each of the soon-to-be-laid-off employees to give me some information for the newsletter, Dick Christopher wrote the following:

In the beginning there was geology, he saw that it was good, and so it was taken. Then came economics, and he saw again that it was good, and again it was taken. He then said, "Let there be a job in the investment field," and a pox fell across the land. Then for many days and nights there was famine, plague, and darkness, and he saw that this was no longer good, and so it was discontinued. Again came geology, and a dove returned with a well log to symbolize a new beginning. He was led out of nine-to-five slavery in a blue logging van with a field map, to the promised land called the MGS.

Here's the deal. I plan to continue my pursuit towards a degree in geology, while staying in the geological community. Upon my graduation in the summer of 1994, if everything goes according to Hoyle, I will hold a B.S. in both economics and geology.

Thanks for the opportunity!

Larger Than a Rat and Smaller Than a Deer

One April morning, the Minnesota Geological Survey staff entertained a local freshwater quality and resources expert. The expert was not identified by business card or formal introduction, but made herself known by certain scatological evidence. Notice of this evidence brought great excitement to the staff, who conjectured over the taxonomical identification suggested by the size, conformation, and sheer abundance of pre-coprolitic matter. Everyone could take part in this identification-fest, as evidence was everywhere a four-legged expert could travel. And our lucky proximity to the state's largest sewer system and the nation's largest waterway suggested many thrilling alternatives. "Larger than a rat and smaller than a deer," was the conclusion.

Finally the call went up, "It's a muskrat and it's under Gary Meyer's desk!" Many came running to see the muskrat firsthand and to see what it might have to say about the Quaternary section as it relates to the Mississippi River and about marshiness in general. Quite a crew collected: secretaries, editors, cartographers, scientists both junior and senior. Overheard at this heady colloquium was, "What is the difference between the groundhog and the muskrat?" "Could you catch this ten-pound muskrat with its one-inch incisors with a string and a shoebox?" "Where are DNR Wildlife when you need them?"

We all got to do a little fieldwork when the animal control guy came with a big net and hook. Gary, who is of course the kind of hands-on geologist who gets up on the rig with the drillers and makes himself useful, wasn't shy about getting close to those long claws and yellow incisors with the net, and made a successful capture that was in turn ably countered by a well-aimed leap by the muskrat.

Watched by a giggling, cheering crowd of dignified intellectuals, the animal control guy finally hooked the muskrat by the neck and hoisted her into the air. He escorted her past the row of jaw-dropped consultants and their briefcases, and carried her gently into the falling snow outdoors where he threw her into his red truck.

The furry expert exited abruptly but left in her wake much good humor and food for thought. Many probably related this tale to guffawing relatives at Easter dinner the following weekend. Many enjoyed crawling behind their desks looking for chewed-up electrical cords and checking one more time to make sure all the evidence had been removed. Puns, debate, and conjecture flowed for days.

All this messing around over muskrats must have worried management, however, for there was a sign affixed to the door at beady-eye level, "No Muskrats Allowed." None of us knew that muskrats could read, but there hasn't been a muskrat in here since.

Sue Benson

MGS Budget Outlook

Elsewhere in this issue the director has commented on the budget situation that MGS faces in the upcoming fiscal biennium. Our basic University State Special budget will increase slightly over its level in the biennium that ended June 30, 1993, and our projected income from non-state sources will be slightly improved. However, our other principal sources of state funding will be substantially diminished from previous levels.

Source	*Biennium 1992-93*	*Biennium 1994-95*
University State Special	$2,168,736	$2,228,000*
Other state contracts		
Minerals Coordinating Committee	510,000	260,000
Recommendations of LCMR	963,000	425,000
DNR, per 1982 Groundwater Act	651,000	574,000
Non-state contracts	265,761	271,519*

(*projected)

Although frugal management and tough priority-setting will be required, MGS will maintain its commitment to top quality public service, education, and research.

New Publication

MGS recently published *A History of Geologic Mapping in Minnesota* by G.B. Morey. The 26-page, full-color publication introduces the concepts of geologic mapping and then tells the story of important geologic maps of Minnesota from 1845 to the present. The price is $8.00. Mail orders must include a check or money order made out to the University of Minnesota. There is a $1.00 postage and handling charge, and Minnesota residents must add 6.5% sales tax. Direct inquiries and orders to Map Sales, (612) 627-4782.

Winter Drilling

This past winter, several Survey geologists were out testing the insulation rating of their Sorel boots and insulated coveralls; they were drilling in the three regional assessment and two county atlas study areas. The purpose of the drilling was to better define the stratigraphy of the glacial deposits. The contractor, North Star Drilling of Little Falls, Minnesota, used Rotasonic drilling, which extracts 9-cm-diameter, continuous core. Drilling began in October in Koochiching and Beltrami counties; many breakdowns and delays later, it wrapped up in March in Rice County. Several cores were drilled at each study area, with each core averaging about 200 feet.

Rotasonic core is useful for identifying the different glacigenic units in the subsurface. Geologists can also determine the nature of the contacts between units (e.g., gradational, erosional). Some cores are cohesive enough to be cut with a rock saw. A variety of tests are planned for the core, including textures, grain counts, geochemical analysis, and paleomagnetic orientation. Survey geologists are also experimenting with making thin sections and X-raying the core to look for fabric in the till. Fabrics, or preferred orientations of the grains, develop during till deposition and can be used to determine the mode of deposition. All of this information helps the glacial geologist to predict the genesis, and therefore distribution, of the deposits in the subsurface. The distribution of potential aquifers in the glacial section is of particular interest.

MGS Staff at GSA Meeting

Howard Hobbs, Tony Runkel, and Rich Lively attended the annual meeting of the North-Central Section, Geological Society of America, in Rolla, Missouri, March 29-30. They also attended a post-meeting field trip on March 31 in the lead-zinc mining district of southeastern Missouri.

Hobbs's talk was titled "The Iowan Erosion Surface in Southeastern Minnesota is a Composite Surface." Runkel's talk was titled "Outlying Mississippi Valley-Type Sulfide Mineralization, Fillmore County, Minnesota." Lively spoke on "Daily and Seasonal Variations of Radon Activity Measured in Mystery Cave," and on "Trace Metal Occurrences in Acid-Insoluble Residues of the Ordovician Galena Group, Southeastern Minnesota."

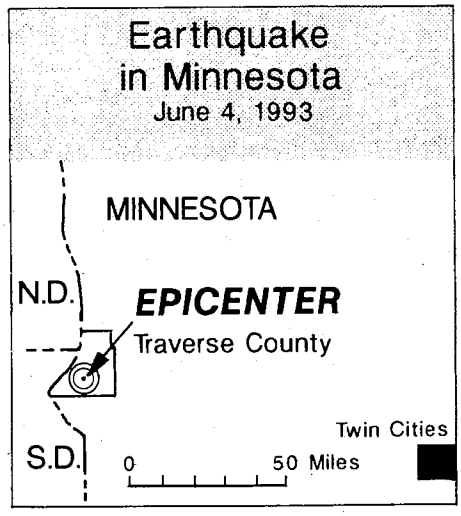
The three MGS scientists sweated through the meetings in the summerlike weather (it was too early to turn on the air conditioning), then on the way home drove into a spring snowstorm near Des Moines.

Mild Earthquake Rattles Minnesota

At about 8:25 P.M. on June 4, a shallow earthquake of magnitude 4.1 occurred near Wheaton, Minnesota. Although there have been minor earthquakes before in Minnesota (most recently, near Morris in 1975), the public perceives the area to be earthquake-free. Thus the June 4 quake was big news indeed.

At the time, Val Chandler, the Survey earthquake expert, was in Indiana and Priscilla Grew, our earthquake-hardened director, was in California. The task of dealing with the media blitz fell to G.B. Morey and Dave Southwick. Later, Val held an informal question-and-answer session with the media at Graceville, near the epicenter, and collected "felt reports" from people in the vicinity.

The epicenter was about 10 miles north of the Great Lakes tectonic zone and close to a northwest-trending fault that offsets it. Cretaceous sedimentary rocks near Lake Traverse have been tilted on faults, providing evidence of mid-cratonic seismic activity in the recent geologic past. We infer that Minnesota's earthquakes record small intra-plate readjustments on Precambrian faults.



MINNESOTA GEOLOGICAL SURVEY
University of Minnesota
2642 University Avenue
St. Paul, Minnesota 55114-1057

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