



The Hydrogeologist

NEWSLETTER OF THE HYDROGEOLOGY DIVISION OF THE GEOLOGICAL SOCIETY OF AMERICA

SEPTEMBER 1996

Message from the Chairman

As I look back on my year as Chairman of the Hydrogeology Division, I have mixed feelings as to where we are and where we are going. On the very positive side, Mary Jo Baedecker has the wonderful problem of fitting a record number of papers into the 1996 Denver Annual Meeting Program. On some days there will be as many as three concurrent Hydrogeology Division sponsored symposia, theme or general sessions not to mention other sessions of potential interest to Division members. Additionally, there will be four short courses or workshops, post-meeting field trip, Birdsall-Dreiss lecture, student reception, and other Division activities. It is shaping up to be a fantastic program with something for everybody. In contrast, the Division continues to lose members and is facing a financial shortfall.

The Hydrogeology Division along with all GSA Divisions is experiencing a significant decline in membership. In the two years since the membership peak in 1993, the Division has experienced a 29 percent decline in membership. From 1990 to 1995 GSA division membership declined 26 percent. Total GSA membership also declined during this period, but not as rapidly as the membership in divisions. Currently less than half of GSA members belong to a division, but take advantage of the division programs. This membership decline is occurring at a time when the Hydrogeology Division program at the Annual Meeting is expanding. Are we becoming like National Public Radio where a few pay for the programs that can be and are enjoyed by the many?

The Management Board has held several conference calls over the past few months to discuss the dual issues of declining membership and the decreasing ability to fund our activities. We have some suggestions for GSA and for the Division. For GSA, we suggest that all GSA members should be required to belong to a division and at the same time strengthen the role of divisions within GSA. GSA could also encourage division membership by requiring that all symposia and theme sessions

at the annual meetings be proposed and sponsored by a division or an associated society.

What can the Division do? First of all, we strongly decided against raising dues. Revenues can be raised, however, by increasing Division membership, encouraging donations to the Birdsall and Dreiss Funds, and soliciting major benefactors to make donations to Hydrogeology Division operations. On the expense side, we are looking at reducing our newsletter costs by placing it and other division materials on the world wide web, cutting our hotel room meeting expenses by holding Management Board meetings in one of our member's rooms or at a restaurant, and changing our awards luncheon and business meeting format.

Why are we losing membership? Is it a lack of interest or perceived value? What are the benefits of Division membership? What is the purpose of the Division? The purposes as defined in our Bylaws are to "(1) bring together scientists interested in hydrogeology, (2) facilitate the presentation and discussion of their problems and ideas, (3) promote research and the publication of results on hydrogeologic studies, (4) cooperate with other Divisions and



Jack Hess
Chairman
Hydrogeology Division

Sections of GSA and with other scientific organizations in fostering, aiding, furthering, and promoting research in hydrogeology, and (5) advise and assist the officers and committees of the Society in matters pertaining to hydrogeology."

You might ask "Where does my \$8.00 Hydrogeology Division dues go?" It is used to support in part the Birdsall-Dreiss Lecturer, printing and mailing of *The Hydrogeologist* newsletter, graduate student research scholarships, and hotel room rental for Division activities including the awards luncheon, Management Board meetings, and student reception. Are these worth \$8.00?

We are open to your suggestions. Please send them to me or any other member of the Management Board. We will be discussing these issues in Denver.

To end on a positive note, I am very pleased to announce the 1996 Division awardees. Details are presented elsewhere in this newsletter. John L. Wilson is this year's O. E. Meinzer Award recipient. The Division Distinguished Service Awards go to John M. Sharp, Jr., and Paul A. Witherspoon, Jr. Mark Person will be the 1997 Birdsall-Dreiss Distinguished Lecturer. My congratulations to all of them for their contributions to the science of hydrogeology and the Hydrogeology Division.

I want to thank all of the Division Committees for their hard work this past year and all of the Division members for allowing me the great privilege of serving as your Chairman for the past year. I look forward to a healthy growing Society and Division. Thank you!

GSA Section Hydrogeology News

North Central

Bill Simpkins, Section Representative

Activities for more than 550 people focused on the 30th Annual North-Central Meeting, held in Ames, Iowa, May 2-3, 1996. Many thanks to Pedro Alvarez, E. Art Bettis, III, Michael R. Burkart, D. Roger Bruner, Doug Connell, Thomas E. Fenton, George R. Hallberg, Edwin Harvey, Blythe R. Hoyle, Robert D. Libra, Debra J. Quade, Angela Rieck-Hinz, Bill Simpkins, Carol A. Thompson, and Carol Wicks for convening the general hydrogeology session, two hydrogeology symposia, and a theme session and for running two field trips. Featured banquet speaker, Dr. Gordon P. Eaton, Director of the USGS and former president of Iowa State University, presented a talk entitled "Employment and education in the geosciences, 1996-2006." The instructor for the Mentors in Applied Geology course, put on by the GSA Institute of Environmental Education, was Dean Lewis from ATC Environmental in Ames, Iowa. The conference was sponsored by the Department of Geological and Atmospheric Sciences at Iowa State University.

Best student paper awards were presented to Caroline LoVetere (Western Michigan University) for her paper "Spatial and temporal variability in the distribution of nitrate in an agriculturally-impacted aquifer, Cass County, Michigan," and to Sarah Vlachos (Iowa State University) for her presentation "Groundwater and surface water interaction in the Walnut Creek watershed of central Iowa."

John L. Wilson is 1996 O. E. Meinzer Awardee

John Wilson is the 1996 recipient of the O. E. Meinzer Award, given to the author of a paper or body of papers of distinction that has advanced the science of hydrogeology or a related field. Nomination comments pointed out that John's publications have made important contributions to analyses related to model parameterization, contaminant and colloid transport, multiphase flow, and flow in the unsaturated zone. Publications cited in Wilson's nomination include:

Wan, Jiamin, and Wilson, J. L., 1994, Visualization of the role of the gas-water interface on the fate and transport of colloids in porous media: *Water Resources Research*, v. 30, no. 1, p. 11-23.

Wilson, J. L., 1993, Induced infiltration in aquifers with ambient flow: *Water Resources Research*, v. 29, no. 10, p. 3503-3512.

Soll, W. E., and Wilson, J. L., 1993, Micromodel studies of three-fluid porous media systems: pore-scale processes relating to capillary pressure saturation relationships: *Water Resources Research*, v. 29, no. 9, p. 2963-2974.

Conrad, S. H., Wilson, J. L., Mason, W. R., and Peplinski, W. J., 1992, Visualization of residual organic liquid trapped in aquifers: *Water Resources Research*, v. 28, no. 2, p. 467-478.

The O. E. Meinzer Award has been given annually since 1965. The complete list of the award-cited papers is found on the Hydrogeology Division's Web site.

Distinguished Service Awards Go To John M. Sharp, Jr., and Paul A. Witherspoon, Jr.

The 1996 Hydrogeology Division Awards for Distinguished Service will be presented to John M. Sharp, Jr., and Paul A. Witherspoon, Jr. The Award for Distinguished Service was established in 1984 and honors George Burke Maxey, a distinguished hydrogeologist, co-founder of the Division, and enthusiastic teacher. The awards will be presented at the luncheon and business meeting of the Hydrogeology Division on Tuesday, October 29, 1996, at the Annual Meeting in Denver.

Mark Person to be 1997 Birdsall-Dreiss Distinguished Lecturer

Mark Person will be the 1997 John Birdsall-Shirley Dreiss Distinguished Lecturer. Please contact Dr. Person as soon as possible to arrange a visit to your institution during his tour [Department of Geology and Geophysics, University of Minnesota, phone: (612) 624-1333, fax: (612) 625-3819, e-mail: mperson@darcy.geo.umn.edu]. Transportation expenses are paid by the Hydrogeology Division; the host institution is expected to provide for the lecturer's local expenses. Dr. Person will speak on one or both of the following topics. Both talks are aimed at audiences with a hydrogeology background but are also appropriate for others in the earth sciences.

Basin-Scale Hydrogeologic Modeling: Problems, Solutions, and Applications

Mathematical modeling of coupled groundwater flow, heat transfer, and chemical mass transport at the sedimentary basin scale has been increasingly used by Earth scientists studying a wide range of geologic processes including the formation of excess pore pressures, infiltration-driven metamorphism, heat flow anomalies, sediment metasomatism, basin tectonics, petroleum generation, and migration. These models have provided important new insights into the rates and pathways of groundwater migration through basins on geologic time scales, the relative importance of different driving mechanisms for fluid flow, and the nature of coupling between the hydraulic, thermal, chemical, and stress regimes. The mathematical descriptions of transport processes, solution methods employed, and application of basin-scale models to reconstruct the paleohydrology of the Great Artesian Basin, Australia, and the Rio Grande Rift System, New Mexico are the subject of the 1997 Birdsall-Dreiss Lecture.

Scientific Visualization in Hydrogeology

Much of the research and consulting work in hydrogeology today involves the interpretation of large amounts of time-dependent data and/or the development of computer models of three-dimensional transport processes. Increasingly, tools for the analysis and display of both observational and simulation data involve three-dimensional visualization. Computer animation of time-dependent hydrogeologic data sets permits analysis of transient hydrodynamic behavior that would be difficult or impossible to detect otherwise. With the recent availability of low-cost visualization computer platforms and software, scientific visualization is now becoming accessible to scientists and practitioners alike. Examples of how visualization has been used in ground flow model calibration, well head delineation, aquifer pump test analysis, and contaminant plume migration are presented.

\$50 Scholarship Award Offered to Early-Registering Students

1996 will be the seventh Annual Meeting for which cash rebates of \$50 will be awarded to the first student members of the Hydrogeology Division who register for Division short courses.

Kirk Nordstrom to Recap 1996 Birdsall-Dreiss Lecture Tour

Kirk Nordstrom will present his Birdsall-Dreiss Lecture, "Negative pH, ultra-acidic mine waters and the challenge of environmental restoration at the Iron Mountain Superfund Anomaly" at the Denver GSA meeting on Tuesday, October 29, after the Division luncheon and business meeting.

Student Research Grant Awards

The Hydrogeology Division Management Board has selected three of the top-rated 1996 recipients of GSA research grants to qualify for the Outstanding Student Award from the Hydrogeology Division. In addition to the financial research grant from GSA, the Hydrogeology Division will award these graduate students with payment for their registration at the Annual Meeting in Denver or a section meeting.

Rachel Ames, M.S. candidate, "Biodegradation of atrazine in subsurface sediments from a former agricultural chemical dealership, Illinois," supervisor: Blythe Hoyle, Iowa State University.

Martin Helmke, M.S. candidate, "Determination of hydraulic conductivity and effective fracture porosity in till from large-diameter, undisturbed core samples," supervisor: Bill Simpkins, Iowa State University.

William Montgomery, Ph.D. candidate, "Groundwater hydraulics and slope stability analysis—elements for prediction of shoreline regression," supervisors: Ronald Chase, Alan Kehew, and Duane Hampton, Western Michigan University.

Hydrogeologist Mugs for Student Research

The Historical Committee of the Hydrogeology Division will offer its fifth collectable Hydrogeologist Coffee Mug honoring Nelson Horatio Darton (1865–1948). Darton was



N. H. Darton

one of the greatest geologic explorers and is highly regarded by hydrogeologists because of his pioneering work on the geology and ground water of the central Great Plains. One of his many reports, USGS Professional Paper 32 (1905) is widely regarded as a classic and was considered by Darton to be his finest work.

The fine-quality mugs are offered in appreciation for contributions to the graduate student research fund. You can get a Darton mug before and after the business

meeting in Denver. Please bring your check for making your contribution. The mugs also can be ordered by contacting Warren Wood. The Historical Committee is seeking new members with special interest in carrying on the Hydrogeologist Mugs series. If you are interested in this service to the Division, please contact Warren Wood. Send your suggestions for next year's Hydrogeologist Mug to Bill Back [e-mail: wback@usgs.gov].

Volunteer Needed for Division's Web Site

You can find the Division's Bylaws, Rules and Regulations, and a bibliography of the 58 articles cited in the Meinzer Awards from 1965 to 1996 on the GSA Hydrogeology Division's Web site at <http://www.aescon.com/geosociety/sectdiv/hydro/index.htm>. Some possibilities for additional information on our Web site include directories of Division officers, members, committees, and the latest copy of *The Hydrogeologist*. We need a volunteer to work with GSA staff and build up our Web site. This might be just the service to fit your talents and interests! Please contact Warren Wood or Alan Dutton if you are interested in contributing this to the Division.

Hydrogeology Program 1996 GSA Annual Meeting in Denver

Following is a brief summary of the Hydrogeology Program at the 1996 Annual Meeting in Denver, put together by Mary Jo Baedecker. The Division has a full program from Sunday through Thursday afternoons. Short courses are offered on Sunday. See your meeting program for final revisions, speakers, titles, and room numbers.

Symposia: Farvolden hydrogeology symposium—John Cherry, convenor; and The role of preferential flow in the unsaturated zone—Bridget Scanlon and Scott Tyler, convenors.

Short Courses: Vadose-zone hydrology: introduction and applications to water and solute transport; Applications of environmental isotopes to solving hydrologic and geochemical problems; Effective teaching of hydrogeology: how to make do with scant real world data.

General Sessions: Hydrogeology I—Physical and chemical hydrogeology; Hydrogeology II—Surficial and general hydrogeology; Hydrogeology posters.

Theme Sessions (Hydrogeology Division): Physical and chemical heterogeneity—impact on reactive transport; Physical and chemical heterogeneity—impact on samples and measurements at wells; Innovations and applications of inverse ground-water models; Hydrogeology of confining units I—sampling, analysis, and interpretation; Hydrogeology of confining units II—physical and biogeochemical processes; Field-scale investigations of biodegradation; Applications of isotopes for understanding hydrologic systems; Diagenetic processes at waste-disposal sites; High Plains hydrogeology; Evaporite karst: Origins, processes, landforms, examples, and impacts.

Theme Sessions (Co-sponsored by Hydrogeology Division): Geologic and hydrologic studies of fluid flow in faults; Application of reactive transport modeling to natural systems; Scale effects of fluid flow and fractures; Geofluids—the role of fluids in crustal processes; The Death Valley hydrogeologic system; Integrated site characterization for waste disposal; The impact of geologic

heterogeneities on characterization, transport, and remediation of non-aqueous phase liquids (NAPLs) at hazardous waste sites; Mechanics of the riverbed—hydrology, sedimentology, and geomorphic consequences.

Field Workshop: Innovative techniques for shallow soil and ground-water investigations.

Field Trip (Post-meeting): Hydrogeology of the San Luis Valley and Summitville Mine, South-Central Colorado.

Student Members Invited to Reception in Denver

Present and potential student members of the Hydrogeology Division are invited to attend the Student Reception and Social Event, which will be held on Tuesday, October 29, 5:00-6:30 p.m. It will immediately follow the presentation of the Birdsall-Dreiss Distinguished Lecture by Kirk Nordstrom. The purpose of this event is to provide hydrogeology students an opportunity to meet and "network" with senior members of the hydrogeology profession, including past Meinzer Awardees, Distinguished Lecturers, and others. We hope that all members can attend this function and support the professional development of students and encourage new membership in the Division. If you know of any students who will attend the Denver meeting, please be sure to tell them about this special event.

Hydrogeology Program 1997 Annual Meeting in Salt Lake City

The 1997 Annual Meeting will be held in Salt Lake City. Please contact Kip Solomon [University of Utah, phone: (801) 581-7231, fax: (801) 581-7065, e-mail: ksolomon@mines.utah.edu] with your suggestions for theme sessions, symposia, field trips, and short courses. The GSA deadlines are December 1, 1996, for short courses and theme sessions and January 1, 1997, for symposia; however, the sooner the better. Theme sessions now under consideration include: Environmental tracers in the unsaturated zone, Hydrogeology of wetlands, Mining impacts on groundwater, Well-head protection in fractured rock aquifers, Basin and Range hydrogeology, and Isotopes in contaminant hydrogeology.

Conference on Sinkholes and the Engineering and Environmental Impacts of Karst

Sinkholes and the Engineering and Environmental Impacts of Karst—the Sixth Multidisciplinary Conference, will be held April 6–9, 1997, in Springfield, Missouri. The meeting is hosted by the Department of Geography, Geology, and Planning at Southwest Missouri State University and P. E. LaMoreaux & Associates, Inc. Dr. John Mylroie, well known specialist in tropical island karst and renown raconteur will be the keynote speaker. For additional information contact Dr. Barry Beck [P. E. LaMoreaux & Associates, phone: (423) 483-7483].

Call for Nominations Mentors in Applied Geology

The GSA's Institute for Environmental Education is now seeking nominations for the Roy J. Shlemon "Applied Geology Mentor Program." Mentors present a one-day workshop for graduate and senior undergraduate geology students on opportunities and challenges in applied geosciences. Mentors should be working in applied geosciences, have at least 15 years' experience outside academia and government, and be active in the geological community. Nominations should include a 1/2-page narrative on the nominee's qualities and experiences, plus relevant professional and biographical material. Nominators must include phone number or e-mail address or both. A mentor will be selected for each of GSA's six section meetings. For more information, call (303) 447-2020 x194. Send nominations to: Applied Geology Mentors Program, Institute for Environmental Education, Geological Society of America, P.O. Box 9140, Boulder, CO 80301 [e-mail: iee@geosociety.org].

Environmental Research Grants Available

Hydrosphere Data Products, Inc., will award \$20,000 in data grants during 1996 to support environmental research worldwide, such as fate and transport of contaminants, watershed ecosystems, hydrologic decision support systems, distributed hydrologic models, riparian habitat rehabilitation, and wetlands restoration. Grant recipients will have free use of titles from Hydrosphere's commercial library of ready-to-use software and environmental databases. Researchers may immediately contact the company for grant applications, which are due October 31, 1996. Criteria for grant awards will be the potential of proposed or ongoing research to yield theoretical advances or technological innovations that encourage sustainable development, public policies, or professional practices. Applicants must show that necessary data are unavailable from existing research resources. Hydrosphere Data Products can be visited at Booth No. 442 in the Exhibit Hall at the GSA Annual Meeting in Denver.

Hydrogeology Division Organization

1996 Management Board

Chairman: Jack Hess
"jack@snsr.unr.edu"

First Vice Chairman: Warren Wood
"wwwood@usgs.gov"

Second Vice Chairman: Darryll Pederson
"pederson@unlinfo.unl.edu"

Secretary-Treasurer: John Harsh
"jfhharsh@usgs.gov"

Past Chairman: Don Siegel
"disiegel@mailbox.syr.edu"

Section Representatives

Cordilleran: Kent Keller
North Central: Bill Simpkins
Northeastern: Bob Melvin
Rocky Mountain: Bill Woessner
South Central: Joe Yelderman
Southeastern: David Evans

Committees

Meinzer Award:
Jean Bahr (Chair), Janet Herman, Frank Chapelle,
Steve Gorelick, Berry Lyons

Distinguished Service Award:
Bill Wilson (Chair), Darryll Pederson, Steve Wheatcraft

Birdsall-Dreiss Lecture:
Fred Philips (Chair)
Chris Neuzil (Coordinator)
Kirk Nordstrom (Lecturer)

Joint Technical Program:
Mary Jo Baedeker (Chair), Kip Solomon

Nominating:
Joe Rosenshein (Chair), Frank Schwartz, Lenny Konikow

Penrose Conference:
Bill Simpkins (Chair), John Cherry, Don Siegel

Membership:

Darryll Pederson (Chair), Bill Woessner

Historical:

William Back (Chair), Claire Davidson, Phyllis Garman,
Alan Dutton, John Harsh, Darryll Pederson, Joe Rosenshein,
Paul Seaber

Representatives to Other Societies & Divisions

American Association for the Advancement of Science, Section W:
John G. Weihaupt

American Geophysical Union (AGU) Hydrology Division:
Nari Narasimhan

American Institute of Hydrology (AIH):
Joe Rosenshein

Association of Ground-Water Scientists and Engineers (NGWA):
Warren Wood

International Association of Hydrogeologists (IAH):
Jack Sharp

GSA—

Engineering Geology:
Tom Holtzer

History of Geology:
Paul Seaber

GSA Council:
John Cherry

Division Web Site:
<http://www.aescon.com/geosociety/sectdiv/hydro/index.htm>

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Send news by electronic mail or computer diskette. Deadline for the Spring 1997 issue of *The Hydrogeologist* is **January 31, 1997**.

