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# Illinois State Geological Survey, 1995-1996

## Publications and Activities

### Annual Report





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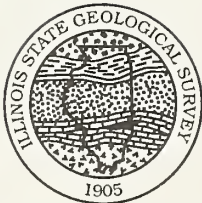
# The Illinois State Geological Survey, 1995–1996

## *Publications and Activities*

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Department of Natural Resources  
ILLINOIS STATE GEOLOGICAL SURVEY  
William W. Shilts, Chief  
Natural Resources Building  
615 East Peabody Drive  
Champaign, IL 61820-6964  
(217) 333-4747



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# Publications

## Illinois State Geological Survey Series

### Bulletins

- B 100.** *Structural Features in Illinois.* **W. John Nelson,** 1995. 144 p., 69 figures, 6 tables, 2 separate plates.
- B 101.** *Geology of the Jonesboro 15-Minute Quadrangle, Southwestern Illinois—Jonesboro, Mill Creek, Ware, and McClure 7.5-Minute Quadrangles.* **W. John Nelson, Joseph A. Devera, and John M. Masters,** 1996. 57 p., 36 figures, 2 tables.
- B 102.** *Bedrock Geology of the Paducah 1° x 2° Quadrangle, Illinois, Kentucky, and Missouri.* **W. John Nelson,** 1996. 40 p., 6 figures., 1 table, 5 separate plates.
- B 103.** *Geology of the Lick Creek Quadrangle, Johnson, Union, and Williamson Counties, Southern Illinois.* **W. John Nelson and C. Pius Weibel,** 1996. 39 p., 24 figures, 1 table, 1 plate.

### Cooperative Reports

- Coop 17.** *Hydrogeology and Groundwater Availability in Southwest McLean and Southeast Tazewell Counties. Part 1: Aquifer Characterization.* **Beverly L. Herzog, Steven D. Wilson, David R. Larson, Edward C. Smith, Timothy H. Larson,** Michael L. Greenslate; with contributions by **John P. Kempton, Samuel V. Panno, Keith C. Hackley, Philip C. Reed, Timothy C. Young,** Stephen L. Burch, Robert D. Olson, Thomas R. Holm, 1995. 70 p., 37 figures, 12 tables.
- Coop 17A.** *Hydrogeology and Groundwater Availability in Southwest McLean and Southeast Tazewell Counties. Part 1: Aquifer Characterization (Appendexes).* **Beverly L. Herzog, Steven D. Wilson, David R. Larson, Edward C. Smith, Timothy H. Larson,** Michael L. Greenslate; with contributions by **John P. Kempton, Samuel V. Panno, Keith C. Hackley, Philip C. Reed, Timothy C. Young,** Stephen L. Burch, Robert D. Olson, Thomas R. Holm, 1995. 143 p.

### Environmental Geology

- EG 149.** *Hydrogeology of the Green River Lowland and Associated Bedrock Valleys in Northwestern Illinois.* **David R. Larson, Beverly L. Herzog, Robert C. Vaiden, Cheri A. Chenoweth, Yunxia Xu,** Richard C. Anderson, 1995. 20 p., 9 figures., 1 table, 7 plates.

### Field Trip Guidebooks

- 1995-C.** *Guide to the Geology of the Elizabeth Area, Jo Daviess County, Illinois.* **David L. Reinertsen, Wayne T. Frankie.** 1995. 34 p. + appendix.
- 1995-D.** *Guide to the Geology of the Casey-Martinsville Area, Clark and Cumberland Counties, Illinois.* **Wayne T. Frankie, Bryan G. Huff, Russell J. Jacobson, Myrna M. Killey, David L. Reinertsen, Vicki May.** 1995. 47 p. + appendix.
- 1996-A.** *Guide to the Geology of the Beardstown Area, Cass, Schuyler, and Brown Counties, Illinois.* **Wayne T. Frankie, Russell J. Jacobson, Myrna M. Killey, Donald E. Luman, Michael L. Barnhardt, Zak Lasemi, Rodney D. Norby, Michael A. Phillips, Joan E. Crockett,** 1996. 75, 34 p.
- 1996-B.** *Guide to the Geology of the Hoopston Area, Vermilion and Iroquois Counties, Illinois.* **Wayne T. Frankie, Myrna M. Killey, Russell J. Jacobson,** 1996. 55, 20 p.

### Illinois Geologic Quadrangle Maps

- IGQ 10.** *Geologic Map of the Bloomfield Quadrangle, Johnson County, Illinois.* **W. John Nelson,** 1995. 1:24,000. 39 x 33 inches.
- IGQ 14.** *Geologic Map of the Jonesboro and Ware Quadrangles, Union County, Illinois.* **W. John Nelson and Joseph A. Devera,** 1995. 1:24,000. 43 x 32 inches.
- IGQ 15.** *Geologic Map of the McClure and Mill Creek Quadrangles, Alexander and Union Counties, Illinois.* **W. John Nelson, Joseph A. Devera, and John M. Masters,** 1995. 1:24,000. 43 x 33 inches.
- IGQ 16.** *Geologic Map of the Cobden Quadrangle, Jackson and Union Counties, Illinois.* **W. John Nelson and Joseph A. Devera,** 1995. 1:24,000. 32 x 47 inches.

### Illinois Mine Subsidence Research Report

- IMSRP XII.** *Findings and Practical Applications from the Illinois Mine Subsidence Research Program, 1985-1993.* Compiled by **Billy A. Trent, Robert A. Bauer, Philip J. Demaris, and Nelson Kawamura,** 1996. 146 p.

## Illinois Minerals

**IM 113.** *Availability of Coal Resources for Mining in Illinois : Galatia Quadrangle, Saline County, Southern Illinois.* **Colin G. Treworgy, Cheri Chenoweth, and Margaret H. Bargh**, 1995. 38 p., 23 figures, 5 tables.

**IM 115.** *Low Oil Prices and the Illinois Oil Industry—Effects, Outlook, and Policy Recommendations.* **Subhash B. Bhagwat**, 1995. 14 p., 26 figures, 1 table.

## Open File Series

**OFS 1995-2.** *Nitrate Leaching Classes of Illinois Soils.* **Donald A. Keefer**, 1995. 1:500,000. 49 x 30 inches.

**OFS 1995-3S.** *Aquifer Sensitivity to Contamination by Nitrate Leaching in Illinois* [statewide map]. **Donald A. Keefer**, 1995. 1:500,000. 49 x 30 inches.

**OFS 1995-3C.** *Aquifer Sensitivity to Contamination by Nitrate Leaching in Illinois* [county maps]. **Donald A. Keefer**, 1995. 1:250,000. 11 x 17 inches each.

**OFS 1995-4.** *Pesticide Leaching Classes of Illinois Soils.* **Donald A. Keefer**, 1995. 1:500,000. 49 x 30 inches.

**OFS 1995-5S.** *Aquifer Sensitivity to Contamination by Pesticide Leaching in Illinois* [statewide map]. **Donald A. Keefer**, 1995. 1:500,000. 49 x 30 inches.

**OFS 1995-5C.** *Aquifer Sensitivity to Contamination by Pesticide Leaching in Illinois* [county maps]. **Donald A. Keefer**, 1995. 1:250,000. 11 x 17 inches each.

**OFS 1995-6.** *Shaded Relief map of Illinois.* **Curtis C. Abert**, 1995. 1:500,000. 54 x 33 inches.

**OFS 1995-7.** *Review of the City of Lake Forest Final Report for the 1994 Beach and Nearshore Monitoring Program, Forest Park Beach, Lake Forest, Illinois.* **C. Brian Trask and Michael J. Chrzastowski**, 1995. 108 p., 1 blue-line plate.

**OFS 1995-8.** *Washability of Trace Elements in Product (Marketed) Coals from Illinois Mines.* **Ilham Demir, Rodney R. Ruch, John D. Steele, and Saleem Khan**, 1995. 24 p.

**OFS 1995-9.** *Author Index of ISGS Publications through September 1995, Exclusive of Maps, Field Trip Guidebooks, and Monthly Oil and Gas Reports.* Compiled by **G. B. Dreher**, 1995. 23 p.

**OFS 1995-10.** *Nearshore Geology and Geologic Processes Along the Illinois Shore of Lake Michigan from Waukegan Harbor to Wilmett Harbor : Contribution to the U.S. Army Corps of Engineers Illinois Shoreline Erosion Interim IV Study.* **Michael J. Chrzastowski and C. Brian Trask**, 1995. 93 p.

**OFS 1995-11.** *Illinois Coal Reserve Assessment and Data Base Development : Final Report for Part 1.* **Colin G. Treworgy, Michael A. Justice, Cheri A. Chenoweth, Margaret H. Bargh, Russell J. Jacobson**, contributions by **Heinz H. Damberger**, 1995. 93 p.

**OFS 1995-12.** *Surface Topography of McHenry County, Illinois*, compiled by **Melisa M. McLean, Maureen D. Kelly and Christopher S. McGarry**, 1995. 1:62,500, 38 x 30 inches.

**OFS 1995-13a.** *Surface Topography of Will and Southern Cook Counties, Illinois.* compiled by **Melisa M. McLean and Edward C. Smith**, 1995. 1:100,000. 35 x 27 inches.

**OFS 1995-13b.** *Topography of the Bedrock Surface in Will and Southern Cook Counties, Illinois.* **Melisa M. McLean and Edward C. Smith**, 1995. 1:100,000. 42 x 27 inches.

**OFS 1995-13c.** *Thickness of Quaternary Deposits in Will and Southern Cook Counties, Illinois.* **Melisa M. McLean and Edward C. Smith**, 1995. 1:100,000. 42 x 27 inches.

**OFS 1995-13d.** *Upper Sand and Gravel Isopach in Will and Southern Cook Counties, Illinois.* **Edward C. Smith and Melisa M. McLean**, 1995. 1:100,000. 35 x 27 inches.

**OFS 1995-13e.** *Basal Sand and Gravel Isopach in Will and Southern Cook Counties, Illinois.* **Edward C. Smith and Melisa M. McLean**, 1995. 1:100,000. 42 x 27 inches.

**OFS 1995-13f.** *Silurian Dolomite Isopach in Will and Southern Cook Counties, Illinois.* **Edward C. Smith and Melisa M. McLean**, 1995. 1:100,000. 34 x 27 inches.

**OFS 1996-1.** *Erosion and Accretion Trends Along the Lake Michigan Shore at North Point Marina and Illinois Beach State Park : Year-1 Report of a Four-Year Study of Coastal Geology and Coastal Geologic Processes*, by **Michael J. Chrzastowski, Anthony M. Foyle, and C. Brian Trask**, 1996. 146 p.

**OFS 1996-2.** *Availability of Coal Resources for Mining in Illinois : Atwater, Collinsville, and Nokomis Quadrangles, Christian, Macoupin, Madison, Montgomery, and St. Clair Counties.* **Colin G. Treworgy, Cheri A. Chenoweth, and Michael A. Justice**, 1996. 33 p.

**OFS 1996-3.** *Availability of Coal Resources for Mining in Illinois : Newton and Princeville Quadrangles, Jasper, Peoria, and Stark Counties.* **Colin G. Treworgy, Cheri A. Chenoweth, and Russell J. Jacobson**, 1996. 38 p.

**OFS 1996-4.** *Preliminary Geophysical Investigation of the Sand and Gravel Aquifers in the Kaskaskia River Valley near Evansville, Illinois.* **Timothy H. Larson,** 1996. 50 p.

**OFS 1996-5.** *A Manual for Conducting Preliminary Environmental Site Assessments for Illinois Department of Transportation Highway Projects.* **Anne L. Erdmann, Robert A. Bauer, Phyllis L. Bannon, Nicholas P. Schneider,** 1996. 40 p.

**OFS 1996-6.** *Review of the City of Lake Forest Final Report for the 1995 Beach and Nearshore Monitoring Program, Forest Park Beach, Lake Forest, Illinois.* **Michael J. Chrzastowski and C. Brian Trask,** 1996. 157 p., 1 blue-line plate.

## Reprints

**1990-O.** *Fuels from Coal by Mild Gasification: a Review.* M.D. Stephenson, A.D. Williams, and C. W. Kruse. (Reprinted from Processing and Utilization of High-Sulfur Coals III: R. Markuszewski and T. D. Wheelock [eds.], Elsevier Science Publishers B.V., Amsterdam, p. 665-674, 1990.)

**1993-N.** *3D Model Identifies Unswept Oil in Illinois's King Field.* **Hannes E. Leetaru.** (Reprinted from Oil and Gas Journal, June 28, 1993, vol. 91, no. 26, pp. 75-80.)

**1993-O.** *Reservoir Characterization and Evaluation of Oil Productivity of Mississippian Cypress Reservoirs of Lawrence Field.* **Emmanuel O. Udegbunam and John P. Grube.** (Reprinted from *Characterizing and Managing the Dynamic Reservoir: A Multi-Disciplinary Approach*, Fourth Annual Archie Conference, November 1-4, 1993, Houston, Texas, pp. 159-171, 1993.)

**1995-E.** *A Preliminary Comparison of Waulsortion Mound Facies in the Williston and Illinois Basins.* Randolph B. Burke, **Zakaria Lasemi.** (Reprinted from 1995 Guidebook: Seventh International Williston Basin Symposium, edited by L. D. Vern Hunter and Robert A. Schalla, pp. 115-128, 1995.)

**1995-F.** *Groundwater Contamination from Municipal Landfills in the USA.* **W. R. Roy.** (Reprinted from Contamination of Groundwater, edited by Domy C. Adriano, Alex K. Iskandar, and Ishwar P. Murarka, Science Reviews, Northwood, UK, pp. 411-446, 1994.)

**1995-G.** *Uncertain Future for Chicago Aggregate Industry.* **Donald G. Mikulic.** (Reprinted from Rock Products, vol. 98, no. 8, August 1995, pp. 21-23, 46.)

**1995-H.** *Off-Site Movement of Pesticide-Contaminated Fill from Agrichemical Facilities during the 1993 Flooding in Illinois.* **W. R. Roy, S.-F.J. Chou, and I. G. Krapac.** (Reprinted from the Journal of Environmental Quality, vol. 24, no. 5, September 1995, pp. 1034-1038.)

**1996-A.** *Constraints on the Availability of Coal for Mining in Illinois.* **C. G. Treworgy, R. J. Jacobson, C. Chenoweth, M. H. Bargh.** (Reprinted from SME Preprint 95-58, for presentation at the SME Annual Meeting, Denver, Colorado, March 6-9, 1995, 7 p.)

**1996-B.** *Microcrystalline Silica (Tripoli) Deposits in Southernmost Illinois.* **Richard B. Berg and John M. Masters.** (Reprinted from Proceedings on the Geology of Industrial Minerals, May 3-8, 1992, Martinsburg, WV, West Virginia Geological and Economic Survey Circular no. 46, 1995, pp. 43-49)

## Other Publications

*1995 Additions to the Geological Samples Library.* **Charles J. Zelinsky,** 1996. 17 p.

*ISGS Geonews.* Vol. 10, no. 3, November 1995. 8 p.

*ISGS Geonews.* Vol. 11, no. 1, May 1996. 8 p.

*Oil and Gas Monthly Report on Drilling in Illinois.* **B. G. Huff and Z. Lasemi,** Numbers 705-706, July 1995-August 1995.

*Oil and Gas Monthly Report on Drilling in Illinois.* 1995-1996. **Huff, B. G.** Numbers 707-714, September 1995-April 1996.

## Final Contract Reports and Other Public Documents

**Bauer, R.S.,** 1995. *Guidelines Resulting from the Illinois Mine Subsidence Research Programs: 1985-1993.* Final Technical Report to the Illinois Clean Coal Institute, September 1, 1994 through August 31, 1995.

**Chou, M.-I.M, I. Demir, R. R. Ruch, J.M. Lytle, S.B. Bhagwat, Y.C. Li, C.L. Chou, F.E. Huggins, G.P. Huffman,** 1995. *Advanced Characterization of Forms of Chlorine, Organic Sulfur, and Trace Elements in Available Coals from Operating Illinois Mines.* Final Technical Report to U.S. Department of Energy and Illinois Clean Coal Institute, September 1, 1994 through August 31, 1995, 32 p.

**Chou, M.-I.M., M. Rostam-Abadi, J.M. Lytle, J.A. Brunius, Y.C. Li, R. Hoeft, S. Dewey, F. Achorn,** 1995. *Manufacture of Ammonium Sulfate Fertilizer from FGD-Gypsum.* Final Technical Report to U.S. Department of Energy and Illinois Clean Coal Institute, September 1, 1994 through August 31, 1995, 35 p.

**Dreher, G.B., W.R. Roy, J.D. Steele, and M. Heidari,** 1995. *Geochemistry of a Reclaimed Coal Slurry Impoundment.* Final Technical Report to U.S. Department of Energy and Illinois Clean Coal Institute, September 1, 1994 through August 31, 1995.

**DuMontelle, P. and R.A. Bauer**, 1996. *Preliminary Geotechnical Evaluation of Proposed Site for Saratoga Dam and Reservoir, Union County, Illinois*. Unpublished manuscript, 33 leaves.

**Frost, J.K., and G.B. Dreher**, 1995. *Near-Neutral Oxidation of Pyrite in Coal Slurry*. Final Technical Report to U.S. Department of Energy and Illinois Clean Coal Institute, September 1, 1994 through May 31, 1995, 26 p.

**Hadley, S.R., L. Khan**, 1995. *Production of Compliance Coal from Illinois Basin Coals*. Final Technical Report to U.S. Department of Energy and Illinois Clean Coal Institute, September 1, 1994 through August 31, 1995.

**Hughes, R.E., G. Dreher, T. Fiocchi, J. Frost, D. Moore, M. Rostam-Abadi, D. Swartz**, 1995. *Brick Manufacture with Fly Ash from Illinois Coals*. Final Technical Report to U.S. Department of Energy and Illinois Clean Coal Institute, September 1, 1994 through August 31, 1995, 25 p.

**Kruse, C.W., C. Chaven, I. Demir, R.R. Ruch, J.M. Lytle, and D.M. Rapp**, 1995. *Illinois Basin Coal Sample Program*. Final Technical Report to the Illinois Clean Coal Institute, September 1, 1994 through August 31, 1995.

**Lizzio, A.A., J.A. DeBarr, G.L. Donnals, C.W. Kruse, M.J. Rood, and S.K. Gangwal**, 1995. *Production and Use of Activated Char for Combined SO<sub>2</sub>/NO<sub>x</sub> Removal*. Final Technical Report to Illinois Clean Coal Institute, September 1, 1994 through August 31, 1995, 40 p.

**Rapp, D., J. Lytle, R. Berger**, 1995. *Production of a Pellet Fuel from Illinois Coal Fines*. Final Technical Report to U.S. Department of Energy and Illinois Clean Coal Institute, September 1, 1994 through August 31, 1995.

**Rapp, D., J. Lytle, S. Bhagwat, R. Berger, B. Gullett, G. Schanche**, 1995. *Production and Combustion Testing of Coal/Sorbent Pellets*. Final Technical Report to the Illinois Clean Coal Institute, September 1, 1994 through August 31, 1995.

**Rostam-Abadi, M., J. Sun, M. Rood, A.A. Lizzio**, 1995. *Novel Carbons from Illinois Coal for Natural Gas Storage*. Final Technical Report to U.S. Department of Energy and Illinois Clean Coal Institute, September 1, 1994 through August 31, 1995, 23 p.

## Outside Publications

### Articles

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**Abert, C.C.**, 1995. *Landforms of Illinois* [flyer]. Illinois State Geological Survey. (Distributed at the 1995 Geological Society of America Annual Meeting in New Orleans.) 2 p.

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**Bauer, R.A.**, 1995. *Bedrock Geological Setting and Geotechnical Properties of Northeastern Illinois*. in Geologic and Hydrogeologic Setting of the Chicago Area, Association of Engineering Geologists, North Central Section, 1995 Short Course. Course Segment II, 16 p.

**Bauer, R.A.**, 1996. [Book Review of] *Geology Applied to Engineering*. Journal of Geoscience Education, vol. 44, no. 2, p. 212

**Boutwell, G.P., T. Hueckel, M.D. Ankeny, R.M. Cohen, M.T. Dukes, D.J. Hermann, B.L. Herzog, L.D. McKay, and T.D. Vandell**, 1996. *Section 7: Floors and Bottom Barriers: Indigenous*. Assessment of Barrier Con-

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**Brady, T.A., M. Rostam-Abadi, and M.J. Rood**, 1996. *Applications for Activated Carbons from Waste Tires: Natural Gas Storage and Air Pollution Control*. Gas Separation and Purification, vol. 10, no. 2, pp. 97-102.

**Cal, M.P., E.D. Dimotakis, J. Economy, S.M. Larson, and M.J. Rood**, 1996. *The Effect of Chemical Modification of Activated Carbon Cloth on the Adsorption Capacity of Organics and Water Vapor*. American Chemical Society, Division of Fuel Chemistry, Preprints of Papers, vol. 41, no. 1, pp. 344-348.

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- Chen, S. and M. Rostam-Abadi**, 1996. *Mercury Removal from Combustion Flue Gas by Activated Carbon Injection: Mass Transfer Effects*. American Chemical Society, Division of Fuel Chemistry, Preprints of Papers, vol. 41, no. 1, pp. 442-446.
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# Recognition and Service

## Honors and Awards

### Prizes, Medals, Honors, and High Offices

**Galen W. Arnold** received the Outstanding New Staff Member Award, November 16, 1995, at the Survey's Annual Review and Poster Fair in Urbana.

**Ross D. Brower** and **Ellen M. Wolf** shared the ISGS' Distinguished Achievement Award, announced November 16, 1995, at the Survey's Annual Review and Poster Fair in Urbana.

**Mark P. Cal** was named an Adjunct Assistant Professor in the Department of Civil Engineering, Environmental Engineering and Science Program at the University of Illinois-Urbana.

**Ben Brandon Curry** was elected a Fellow of the Geological Society of America and nominated to Marquis' Who's Who List of Scientists and Engineers in 1995.

**Joseph A. DeBarr** and co-author **Anthony A. Lizzio** received the R.A. Glenn Award for best paper, entitled "The Mechanism of SO<sub>2</sub> Removal by Carbon," presented at a symposium of the Fuel Chemistry Division, during the 211th national meeting of the American Chemical Society, March 24-28, 1996, in New Orleans, LA.

**David A. Grimley** received his Ph.D., spring 1996, from the Department of Geology at the University of Illinois-Urbana.

**Beverly L. Herzog** is included in Who's Who in Science and Engineering, Third Edition for 1996-97 and Who's Who in America, 49th-50th Edition for 1995-96.

**Hue-Hwa Hwang** passed the defense of her dissertation for a Ph.D. from the Department of Geology, University of Illinois-Urbana.

**Timothy H. Larson** received certificates of appreciation for his service as Chair and Co-Chair of the Public Affairs Committee of the Environmental and Engineering Geophysical Society.

**E. Anne Latimer** was awarded the degree of Master of Arts in geography by the University of Illinois at Urbana-Champaign in August, 1995.

**Donald E. Luman** received the Second Place Award for "Best Scientific Paper in Remote Sensing," from the American Society for Photogrammetry and Remote Sensing.

**Massoud Rostam-Abadi** was appointed an Adjunct Associate Professor in the Department of Civil Engineering, Environmental Engineering and Science Program, at the University of Illinois-Urbana.

**Barbara J. Stiff** received her Master of Science Degree in Physical Geography from the University of Illinois-Urbana.

**Colin G. Treworgy** has received Certification as a Coal Geologist from the Division of Professional Affairs of the American Association of Petroleum Geologists.

## Scientific and Educational Contributions

### Papers Presented at Scientific Meetings

**Curtis Abert** presented the poster, "Shaded Relief Map of Illinois," at the Midwest-Great Lakes ARC/INFO User Conference, September 26-29, 1995, in Champaign. At the same meeting, he and **Christopher S. McGarry** co-presented the demonstration/talk, "Using ARCSCAN." Abert repeated the poster presentation on the "Shaded Relief Map of Illinois" at the fall conference of the Illinois Geographic Information System Association, December 4-5, 1995, in Schaumburg, and spoke on "Using DEMs and the Shaded Relief Map of Illinois." At the Illinois Quaternary Association's meeting, April 26, 1996, in Charleston, he talked about his recent work with end moraines of the Wisconsin glacial episode. He presented the paper, "Modeling Glaciated Terrains with ARC/INFO Tools," and the poster, "Shaded Relief Map of Illinois," at the 16th annual

Environmental Systems Research Institute User Conference, May 20-24, 1996, in Palm Springs, CA.

**Michael L. Barnhardt** presented the paper, "Evaluating Contaminant Distribution in Soil at Agrichemical Facilities," at the national meeting of the American Society of Agronomy and Soil Science Society of America, October 30-November 3, 1995, in St. Louis, MO.

**Robert A. Bauer** presented a paper, "Bedrock Geologic Setting and Geotechnical Properties in Northeastern Illinois," for a short course on the Geologic and Hydrogeologic Setting of the Chicago Area during the meeting of the North-Central Section of the Association of Engineering Geologists, September 22, 1995, in Chicago. At the 38th annual meeting of the Association of Engineering Geologists, October 2-8, 1995, in Sacramento, CA, he



presented the paper, "Engineering Geology Programs at the Illinois State Geological Survey" and attended a field trip on the "Geology and Engineering Geology of the Sacramento Valley and Napa Valley." Bauer also presented a poster on the mapping efforts of the Central U.S. Earthquake Consortium (CUSEC) State Geologists at the annual meeting of CUSEC, November 13-15, 1995, in St. Louis, MO, during which he participated in workshops that addressed CUSEC's multistate response plan for mutual aid, energy, mass casualties, transportation, post-earthquake building inspections and public health. He gave a poster presentation on the CUSEC State Geologists' mapping work in the Midwest at the annual meeting of the Seismological Society of America, April 1-3, 1996, in St. Louis, MO.

**Richard C. Berg** presented the paper "Distribution, thickness and age of an early Quaternary (Pre-Illinoian) lithostratigraphic sequence in east-central Illinois" at the annual meeting of the Geological Society of America (GSA), November 6-9, 1995, in New Orleans, LA, and "Mapping of Quaternary deposits and analysis of aquifer sensitivity for McHenry County, Illinois" at the 30th annual meeting of the North-Central Section of GSA, May 2-3, 1996, in Ames, IA. He also hosted an exhibit of maps at the National Environmental Health Association's meeting, June 30-July 2, 1996, in Chicago.

**Subhash B. Bhagwat** made a presentation on "Targeting Coal Research for Success" at the meeting of the ISGS' Coal Advisory Committee, May 13, 1996, in Champaign.

**Ross D. Brower** and **Timothy C. Young** presented a display featuring information on groundwater and related services available from the ISGS at the Illinois Specialty Growers Association's Convention and Trade Show, January 8-9, 1996, in Decatur, during which Brower also attended presentations of technical papers, the association's annual meeting, and the annual meeting of the Illinois Irrigation Association. **Brower** and **Young** also presented the same display at the annual meeting of the Illinois Association of Groundwater Professionals, March 25-26, 1996, in Peoria, at which Brower attended the technical sessions and annual meeting.

**Chusak Chaven** presented posters on the "Illinois Basin Coal Sample Program (IBCSP)" at the Illinois Clean Coal Institute's 13th annual Contractors' Technical Meeting, August 8-9, 1995, and at the meeting of the ISGS' Coal Advisory Committee, May 13, 1996, in Champaign. He also summarized the 1995-96 activities of the IBCSP for its advisory committee, May 31, 1996, in Carterville.

**Scott Chen** presented a paper, "Mercury removal from combustion flue gas by carbon injection process: Mass transfer effects," at the 211th national meeting of the American Chemical Society, March 24-28, 1996, in New Orleans, LA.

**Chen-Lin Chou** presented a poster, "Compositional characterization of Miocene coals from Taiwan," at the

annual meeting of the Geological Society of America, November 6-9, 1995, in New Orleans, LA. At the 30th annual meeting of the North-Central Section of the Geological Society of America, May 2-3, 1996, in Ames, IA., Chou gave the paper, "Trace element abundances and lithology of Paleozoic carbonate rocks from ten Illinois quarries," and co-chaired Session 19 on "Paleontology, Stratigraphy, and Sedimentology."

**Mei-In Melissa Chou** presented the following papers: "Advanced characterization of forms of chlorine, organic sulfur, and trace metals in available coals from operating Illinois mines," at the Illinois Clean Coal Institute's 13th annual Contractors' Technical Meeting, August 8-9, 1995, in Champaign; "Chlorine in five Illinois coals and three British coals: An X-ray Absorbance Near Edge Structures (XANES) Spectroscopic Investigation" and "Manufacture of Ammonium Sulfate Fertilizer from FGD-Gypsum," at the meeting of the Fuel Division of the American Chemical Society (ACS), August 20-24, 1995, in Chicago, the last paper being repeated at the meeting of the Fuel Division of ACS, March 24-28, 1996, in New Orleans, LA.

**Ben Brandon Curry** presented the paper, "The paleochemistry of Lake Manitoba through the eyes of ostracodes," at the annual meeting of the Geological Association of Canada, May 27-29, 1996, at the Department of Geology, University of Manitoba, in Winnipeg. In association with the meeting, he attended a field trip on the "Sedimentology, geomorphology and history of the central Lake Agassiz Basin," May 29-31, 1996, in Winnipeg.

**Heinz H. Damberger** presented the following papers: "Moisture in Coal - Geologic and Tax Implications," at the annual meeting of the Geological Society of America, November 6-9, 1995, in New Orleans, LA; and "The Excess Moisture Problem - Tax Implications of the Natural and Inherent Moisture Content of Coal" and, with **Colin Treworgy**, "Low and Medium Sulfur Coals in Illinois: Reserves and Production" at the annual meeting of the ISGS' Coal Advisory Committee, May 13, 1996, in Champaign. Damberger organized the program for the meeting and secured an outside speaker to discuss the outlook for Illinois' coal industry.

**Thomas E. Davis** presented an exhibit of oil and gas research conducted at the ISGS and assistance provided to oil operators by the Petroleum Technology Transfer Council (PTTC), March 7-8, 1996, at the annual meeting of the Illinois Oil and Gas Association, in Evansville, IN. He also made a presentation on the activities and plans of the PTTC, May 15, 1996, to the Michigan Geological Society.

**Joseph A. DeBarr** made the following presentations: a paper, "High Value Products from Illinois Coal," at the Illinois Mining Institute, September 28-29, 1996, in Collinsville; a paper, "Coal-based Carbon Adsorbents for Combined SO<sub>2</sub>/NO<sub>x</sub> Removal from Flue Gas," at the annual meeting of the American Institute of Chemical Engineers, November 12-17, 1995, in Miami Beach, FL;

and a paper and poster on "Adsorption of SO<sub>2</sub> on Bituminous Coal Char and Activated Carbon Fiber Prepared from Phenol Formaldehyde," and two additional papers, "Valuable Products from Utility Fly Ash" and "Applications of Thermal Analysis Techniques in Activated Carbon Production," at the 211th national meeting of the American Chemical Society, March 24-28, 1996, in New Orleans, LA.

**Philip J. DeMaris** presented the paper, "Utilization of fly ash in structural and decorative ceramic products," at the meeting of the ISGS' Coal Advisory Board, May 13, 1996, in Champaign.

**Gary B. Dreher** presented the poster, "Geochemistry of a Reclaimed Coal Slurry Impoundment," at the Illinois Clean Coal Institute's 13th annual Contractors' Technical Meeting, August 8-9, 1995, in Champaign.

**Anthony M. Foyle** presented the paper, "Spatial and temporal impacts of harbor and marina construction along the northern Illinois coast of Lake Michigan," at the 31st annual meeting of the Northeastern Section of the Geological Society of America, March 21-23, 1996, in Buffalo, NY, after which he attended a field trip on the "Silurian Stratigraphy and Quaternary Geology of the Niagara Area." He also presented the paper, "1995 monitoring of beach and nearshore geomorphic changes at North Point Marina and Illinois Beach State Park, Illinois," at the 30th annual meeting of the North-Central Section of the Geological Society of America, May 2-3, 1996, in Ames, IA.

**David A. Grimley** made the following presentations: the paper, "Illinoian and Pre-Illinoian loesses and associated Sangamonian, Yarmouthian and Older Paleosols in unglaciated southwestern Illinois and eastern Missouri," at the annual meeting of the Geological Society of America (GSA), November 6-9, 1995, in New Orleans, LA; and the poster, "Quaternary geological mapping and glacial geology in a Wisconsin interlobate area: Kane County Illinois," at the 30th annual meeting of the North-Central Section of GSA, May 2-3, 1996, in Ames, IA, after which he attended a field trip, "Hogs, Logs and Bogs: Quaternary Deposits and Environmental Geology of the Des Moines Lobe," May 4-5, 1996.

**John P. Grube** made the presentation, "Reservoir Development in the 'Warsaw' Carbonates of the Illinois Basin," at the meeting of the Illinois Geological Society, the Indiana/Kentucky Geological Society, and the Society of Petroleum Engineers, November 16, 1995, in Grayville. He also exhibited the poster, "Warsaw," at the Illinois Oil and Gas Association's annual meeting, March 7-8, 1996, in Evansville, IN.

**Keith C. Hackley** presented a paper, "Long-term degradation of ground-water quality and vegetation in a fen-wetland complex resulting from development within its watershed," at the 40th annual Midwest Groundwater Conference, October 16-18, 1995, in Columbia, MO.

**Manoutchehr Heidari** made the following presentations: the invited paper, "Aquifer calibration models and their role in the management of groundwater resources," at the Regional Conference on Water Resources Management, August 28-September 1, 1995, at Isfahan University of Technology, Isfahan, Iran; the invited paper, "Development and test of groundwater management models," at the Zanjan Water Resources Development Board, September 5, 1995, in Zanjan, Iran; and the paper, "Storage and transport of agrichemicals in unsaturated zone of alluvial aquifers during normal rainfall and flood conditions," at the Sixth annual Conference of the Illinois Groundwater Consortium on "Research on Agricultural Chemicals in Illinois Groundwater: Status and Future Directions VI," March 27-28, 1996, in Makanda.

**Kathleen M. Henry** presented the poster, "Illinois Basin Coal Sample Program," at the Illinois Clean Coal Institute's 13th annual Contractors' Technical Meeting, August 8-9, 1995, in Champaign.

**Beverly L. Herzog** presented the paper, "Indigenous Floors and Bottoms: Measuring Liquid Transport Properties under Saturated Conditions," at the International Containment Symposium, August 28-30, 1995, in Baltimore, MD.

**James C. Hester** presented the poster, "Pusikbukit Volcano: A Post-Caldera Composite volcano in the Toba Caldera, Sumatra, Indonesia," at the 30th annual meeting of the North-Central Section of the Geological Society of America, May 2-3, 1996, in Ames, IA.

**Jennifer K. Hines** presented the poster, "Women in Geology," at the annual career fair on women in science sponsored by the American Association of University Women, February 24, 1996, in Springfield.

**Randall E. Hughes** presented the following papers: "Brick manufacture with fly ash from Illinois coals," at the Illinois Clean Coal Institute's 13th annual Contractors' Technical Meeting, August 8-9, 1995, in Champaign; "Utilization of fly ash in structural and decorative ceramic products," at the 211th annual meeting of the American Chemical Society, March 24-28, 1996, in New Orleans, LA; "Sourcing the Cahokia Middle Mississippian flint clay figurines," at the International Symposium on Archaeometry, May 20-24, 1996, in Urbana; and "Sequential acid dissolution of clay minerals: Tracking structural composition," at the annual meeting of the Clay Minerals Society, June 15-20, 1996, in Gatlinburg, TN.

**Donald A. Keefer** made the following presentations: the paper, "Evaluating Contaminant Distribution in Soil at Agrichemical Facilities," at the 1995 annual meeting of the Soil Science Society of America, October 30-November 3, 1995, in St. Louis, MO; and the paper, "Characterization of the Field-Scale Preferential Transport of Solutes in a Tile-Drained Soil," at the Sixth annual Conference of the Illinois Groundwater Consortium on "Research on Agricultural Chemicals in Illinois Ground-

water: Status and Future Directions VI," March 27-28, 1996, in Makanda.

**Myrna M. Killey** presented the poster, "Easternmost extent of western-source pre-Illinois sediments in Illinois," at the 30th annual meeting of the North-Central Section of the Geological Society of America, May 2-3, 1996, in Ames, IA, after which she attended the field trip, "Hogs, Logs, and Bogs: Quaternary Deposits and Environmental Geology of the Des Moines Lobe," May 4-5, 1996.

**Dennis R. Kolata** presented the paper, "The Middle Ordovician Taconian Orogeny (Blountian tectophase): associated volcanism and uplift of the Midcontinent (U.S.A.) arches and domes," at the annual meeting of the Geological Society of America, November 6-9, 1995, New Orleans, LA.

**Robert J. Krumm** made the following presentations: "Applying GIS Technology to Geologic Mapping," at the annual meeting of the Illinois Groundwater Association, October 20, 1995, in Normal; "A Guide to Digital Databases at the Illinois State Geological Survey," at the winter conference of the Illinois Geographic Information System (GIS) Association, December 4-5, 1995, in Schaumburg; "Geologic Mapping Activities and Geographic Information Systems," at a meeting of the Central Illinois Chapter of the Soil and Water Conservation Society, January 16, 1996, in Champaign; "Procedures for Implementing a Sensitive GIS Project," at the 16th annual Environmental Systems Research Institute User Conference, May 20-24, 1996, in Palm Springs, CA.

**Zakaria Lasemi** presented the paper, "A preliminary comparison of Waulsortian mound facies in the Williston and Illinois Basins," at the Seventh International Williston Basin Symposium, July 23-25, 1995, in Billings, MT, during which he attended the core workshop on Ordovician and Mississippian carbonate reservoir rocks and Waulsortian mounds and attended a field trip, "Mississippian Carbonates and Waulsortian Mounds," July 20-22, 1995. He also made the following presentations: the paper, "Depositional history of the middle Mississippian Ullin ('Warsaw') and Fort Payne formations: from Waulsortian mounds to storm-generated sand waves," at the Great Lakes Section of the Society for Sedimentary Geology's Field Conference, October 6, 1995; the posters, the "Middle Mississippian carbonate mud mounds of the Fort Payne Formation in the southern part of the Illinois Basin" and "The relationship between depositional facies and the quality of limestone resources; an example from the middle Mississippian Salem Limestone," at the 30th annual meeting of the North-Central Section of the Geological Society of America, May 2-3, 1996, in Ames IA; and the poster, "Micrites as potential clues to changes in Phanerozoic ocean-atmosphere composition," at the research conference of the Society for Sedimentary Research and the International Association of Sedimentologists on "Carbonates and Global Change: an Interdisciplinary Approach," June 1996, in Wildhaus, Switzerland.

**Anthony A. Lizzio** presented the following papers: "Production of Low Surface Area Char for Cleanup of Incinerator Flue Gas" and "Oxidation/Desorption Treatment of Carbon to Enhance its Adsorptive/Catalytic Properties," both at the 22nd biennial Conference on Carbon, July 1995, in San Diego, CA; "Production and Use of Activated Char for Combined SO<sub>2</sub>/NO<sub>x</sub> Removal," at the Illinois Clean Coal Institute's 13th annual Contractors' Technical Meeting, August 8-9, 1995, in Champaign, which was repeated at the 12th annual Pittsburgh Coal Conference, September 1995, in Pittsburgh, PA, and given again at the International Activated Carbon Conference, September 1995, in Pittsburgh, PA; and "Production of Activated Char from Illinois Coal for Flue Gas Cleanup," at the Florida Environmental Chemistry Conference, November 1995, in Palm Coast, FL; "The Mechanism of SO<sub>2</sub> Removal by Carbon" and "Production of Activated Char from Illinois Coal for Flue Gas Cleanup," both at the 211th national meeting of the American Chemical Society, March 24-28, 1996, in New Orleans, LA. For this meeting, Dr. Lizzio organized and chaired the symposium on "Production and Use of Carbon-Based Materials for Environmental Cleanup." He also presented the paper, "Production and Use of Activated Char for Combined SO<sub>2</sub>/NO<sub>x</sub> Removal," at the annual meeting of the ISGS' Coal Advisory Committee, May 13, 1996, in Champaign, and the poster on his SO<sub>2</sub>/NO<sub>x</sub> project at the Workshop on Carbon Materials for the Environment, sponsored by the American Carbon Society, June 9-12, 1996, in Charleston, SC.

**Donald E. Luman** presented the paper, "The Land Cover of Illinois Inventory," at the winter conference of the Illinois Geographic Information System Association, December 4-5, 1995, in Schaumburg. At that meeting, he also presented "Fundamentals of Image Data" and "Using USGS Digital Orthophoto Quadrangles and Quantized Historical Aerial Photography in Environmental Applications" at the Image Data Workshop.

**John M. Lytle** presented the paper, "Manufacture of Ammonium Sulfate Fertilizer from FGD-Gypsum," at the meeting of the Fuel Chemical Division of the American Chemical Society, August 20-24, 1995, in Chicago.

**John H. McBride** presented the poster, "Possible Seismogenic Structure in the Wabash Valley Seismic Zone: Preliminary Observations from Seismic Reflection Data," at the annual meeting of the Seismological Society of America, April 1-3, 1996, in St. Louis, MO.

**Christopher S. McGarry** made the following presentations: "Using DRGs and ArcScan to Produce a Hypsometric Map," at the meeting of the ISGS' Mapping Advisory Committee, June 3, 1996, in Champaign; "Geologic Modeling for Landfill Screening: Integrating GIS with Geospatial Modeling," at the Third International Conference and Workshop on Integrating GIS and Environmental Modeling, January 21-25, 1996, in Santa Fe, NM; and "Using DRGs and ArcScan to Create a Digital Topography" and "Surface Topography of Carroll County, Illinois,"

at the Midwest-Great Lakes ARC/INFO User Conference, September 26-29, 1995, in Champaign.

**Edward Mehnert** made the following presentations: the poster, "Estimating Transmissivity Using a Well's Response to a Forced Oscillation," at the National Ground Water Association's Convention and Exposition, October 28-30, 1995, in Indianapolis, IN; the paper, "A Monitoring Program to Test Aquifer Sensitivity Mapping for Illinois' Generic State Management Plan," at the 40th annual Midwest Groundwater Conference, October 17, 1995, in Columbia, MO; and the paper, "The Impact of Flooding on the Water Quality of an Alluvial Aquifer at Henry, Illinois: Progress During the First Year," at the Sixth annual Conference of the Illinois Groundwater Consortium on "Research on Agricultural Chemicals in Illinois Groundwater: Status and Future Directions VI," March 27-28, 1996, in Makanda.

**Daniel O. Nelson** presented "DOCUMENT.AML for Beginners" at the Midwest-Great Lakes ARC/INFO User Conference, September 26-29, 1995, in Champaign. He also presented the poster, "The Regional Data Model Applied to Illinois Coal Resources: Managing Data for Multi-Layered Overlapping Coal Strata," at the 16th annual Environmental Systems Research Institute User Conference, May 20-24, 1996, in Palm Springs, CA.

**W. John Nelson** presented the poster, "Late Tertiary/Quaternary Tectonism in Southernmost Illinois," at the annual meeting of the Seismological Society of America, April 1-3, 1996, in St. Louis, MO.

**Matthew H. Riggs** made the following poster presentations, "Potential for Contamination Mapping and Aquifer Sensitivity Mapping in North Central Lake County, Illinois" and, with Barbara Stiff, "The Geologic Connection in Environmental Risk: Illinois from the Surface Down," at the 16th annual Environmental Systems Research Institute User Conference, May 20-24, 1996, in Palm Springs, CA. Riggs spoke on "Geologic Mapping for Solid Waste Disposal Facility Siting Project," at the summer conference of the Illinois Geographic Information System Association, June 3-4, 1996, in Champaign.

**J. Bruno Risatti** gave the paper, "Transport and Fate of Agrichemicals in an Alluvial Aquifer," at the Sixth annual Conference of the Illinois Groundwater Consortium on "Research on Agricultural Chemicals in Illinois Groundwater: Status and Future Directions VI," March 27-28, 1996, in Makanda.

**Nancy L. Rorick** made an oral presentation on the "Evaluation of a Wetland Creation Site in Southern Illinois Using a Water-Budget Approach" and attended a short course on the "Hydrogeology and Geochemistry of Wetlands" at the annual meeting of the Geological Society of America, November 6-9, 1995, in New Orleans, LA.

**Massoud Rostam-Abadi** made the following presentations: the paper, "Production of Adsorbent Carbon from Illinois Coal for Natural Gas Storage," at the Eighth Inter-

national Conference on Coal Science, September 10-15, 1995, in Oviedo, Spain; and the paper, "Carbon-Based Processed for Multi-Pollutant Control," at the annual meeting of the American Institute of Chemical Engineers, November 12-17, 1995, in Miami Beach, FL. For that meeting, he organized and chaired the symposium on multi-pollutant control. He was an invited speaker on "Coal-Based Activated Carbon for Mercury Vapor Removal," June 13, 1996, in the Department of Chemical Engineering, at the University of Queensland, Australia. Rostam-Abadi gave a plenary lecture on "Marketable Products from Utility Fly Ash and FGD Gypsum," June 18-21, 1996, at the Asian-Pacific Conference on Sustainable Energy and Environmental Technology in Singapore.

**William R. Roy** presented the paper, "Fate and Transport of Atrazine in Fill Materials at Agrichemical Facilities," at the Sixth annual Conference of the Illinois Groundwater Consortium on "Research on Agricultural Chemicals in Illinois Groundwater: Status and Future Directions VI," March 27-28, 1996, in Makanda.

**Beverly J. Seyler** presented the paper, "Diagenetic Alteration and Porosity Enhancement of Two Middle Mississippian Sandstone Reservoirs," March 12, 1996, at the meeting of the Illinois Basin Working Group, U.S. Geological Survey, in Denver, CO.

**Barbara J. Stiff** made the following presentations: "Better Maps with ArcPlot," September 26-29, 1995, at the Midwest-Great Lakes ARC/INFO User Conference, in Champaign; "ISGS Cartographic Products," February 14, 1996, at the Illinois Geographic Information System Association Conference in Springfield; and the posters, "Presentation Maps on Demand" and, with Matt Riggs, "The Geological Connection in Environmental Risk Assessment—Illinois from the Surface down," May 19-24, 1996, at the 16th annual Environmental Systems Research Institute User Conference, Palm Springs, CA.

**Christopher J. Stohr** presented the following papers: "Accuracy and Data Conversion of GPS to GIS for Natural Resources Studies," at the Midwest-Great Lakes ARC/INFO User Conference, September 26-29, 1995, in Champaign, and "Classification of Infiltration in Depressions Using Uncalibrated, Thermal-Infrared Imagery and Observations of Spectral Differences in Ragweed Associated with Gas Leakage in Landfill Covers" and "Preservation of Irreplaceable Historical Aerial Photography," at the 11th Applied Geologic Remote Sensing Conference, February 20-21, 1996, in Las Vegas, NV.

**C. Brian Trask** presented the paper, "Changes in Littoral Sediment Supply and Impacts to an Engineered Structure on Lake Michigan at Lake Forest, Illinois," at the annual meeting of the Geological Society of America, November 6-9, 1995, in New Orleans, LA.

**Colin G. Treworgy** presented the paper, "Availability of Coal for Future Mining in Illinois and an Update on Coal Availability Studies in the U.S.," at the meeting of the

ISGS' Coal Advisory Committee, May 13, 1996, in Champaign.

**Emmanuel Udegbunam** presented the paper, "A Reservoir Model for Hillsboro Gas Storage Field Management," at the Eastern Regional Meeting of the Society of Petroleum Engineers, September 1995, in Morgantown, WV.

**C. Pius Weibel** presented the paper, "Sedimentary Analysis of the Cretaceous Baylis Formation, Western Illinois," at the 30th annual meeting of the North-Central Section of the Geological Society of America, May 2-3, 1996, in Ames, IA, prior to which he attended the field trip, "Mid-Cretaceous Fluvial Deposits of the Western Margin, Western Interior Basin: Nishnabotna Member, Dakota Formation, on May 1. He also gave the paper, "Karst Terrains and Carbonate Bedrock of Illinois," at the 16th annual Environmental Systems Research Institute User Conference, May 19-23, 1996, in Palm Springs, CA.

## Scientific Workshops/Training Courses Taught or Attended

**Daniel J. Adomaitis, Phyllis L. Bannon, Rodney E. Bowen, Nancy I. Caldwell, Keith W. Carr, Somendra Chakravorty, Anne L. Erdmann, Damon A. Garner, James W. Geiger, Mark A. Hart, and C. Brian Trask** participated in a 40-hour safety training course for hazardous waste workers, July 10-14, 1995, in Champaign, which Adomaitis helped set up. The course is required annually to bring persons who may come in contact with hazardous materials into compliance with federal regulations. Mr. Adomaitis also successfully completed an X-ray machine safety training course at the University of Illinois's Division of Environmental Health and Safety during April 1996 in Urbana.

**Phyllis L. Bannon** took a course, "Due Diligence at Dawn: Historical Research for Phase I Environmental Site Assessments," November 16, 1995, in Chicago. **Bannon, Robert J. Krumm, and C. Brian Trask** attended the "Association for Information and Image Management Expo," April 1, 1996, in Chicago.

**Robert A. Bauer** made the following presentations during 1995-1996: an update on the mapping of soil amplification in the Paducah 1° X 2° Quadrangle at the CUSEC State Geologists' meeting, July 18-19, 1995, in Cape Girardeau, MO; a paper on "Seismic Hazard Mapping and Loss Reduction Methodology," at the Natural Disaster Awareness Day Program, October 11, 1995, in Springfield; and a summary of the Illinois Mine Subsidence Research Program at the meeting of the ISGS' Coal Advisory Committee, May 13, 1996, in Champaign. He served as an instructor on the following occasions: for the Applied Technologies Council's course on Post-Earthquake Evaluation of Buildings, August 29, 1995, in Peoria, August 30, 1995, in Springfield, and May 7-8, 1995, in Carbondale; and for participants of the October 30, 1995, Illinois Emergency Management Agency's earthquake

exercise on possible impacts of earthquakes in the Midwest. Prior to the exercise, on October 27 in Edwardsville, Mr. Bauer reviewed what to expect when an earthquake occurs, and how the earthquake exercise scenarios were developed by the ISGS for local emergency managers. He also participated in the CUSEC Earthquake Mitigation Workshop, March 26-28, 1996, in Memphis, TN, and, with **David Gross** and **Janis Treworgy**, the American Physical Society's workshop, June 24-July 2, 1996, in Snowmass, CO, to work on two papers concerning tunneling technology and geology of the greater Fermilab region.

**Steven E. Benton** and **Christine S. Fucciolo** attended workshops on "Wetland Identification and Delineation," May 7-8, 1996, and "Hydric Soil Identification for Wetland Delineation," May 9-10, 1996, in Lexington, KY.

**Richard C. Berg** participated in work group meetings of the American Society for Testing and Materials (ASTM), July 9-11, 1995, October 22-24, 1995, and May 29-31, 1996, in Denver, CO, and attended the national meeting of ASTM, June 16-19, 1996, in Orlando, FL.

**Subhash B. Bhagwat** attended the Illinois Energy Conference, November 20-21, 1995, in Chicago.

**Christopher J. Black** and **Somendra Chakravorty** attended a short course, "Geologic and Hydrogeologic Setting of the Chicago Area," presented by the Association of Engineering Geologists, September 22, 1995, in Chicago. **Black** and **Dale R. Schmidt** attended the 40-hour Hazardous Waste Training course, March 25-29, 1996, in Palos Hills.

**Rodney E. Bowen** completed a course in Physical Geology, spring 1996, at Parkland College, in Champaign.

**Keith W. Carr** and **Damon A. Garner** attended a short course on Environmental Chemistry for Investigating and Remediating Soil and Groundwater Contamination, September 18-20, 1995, in Madison, WI.

**Chusak Chaven** chaired a session on the American Society for Testing and Materials' (ASTM) Coal Sample Database at the annual ASTM D5.05 Conference, May 5-8, 1996, in Pittsburgh, PA.

**Joan E. Crockett** coordinated a focused technology workshop, "Introduction to an Emerging Technology: 3-D Seismic," presented by the Midwest Regional Office of the Petroleum Technology Transfer Council, September 28, 1995, at the Illinois Oil and Gas Association in Mt. Vernon.

**Thomas E. Davis** set up the following workshops for persons working in the oil industry: "Class I - Fluvially Dominated Deltaic Reservoirs," presented on February 27, 1996, in Grayville; "Horizontal Drilling," presented on March 13, 1996, in Grayville; and "Problem Identification," presented on May 16, 1996, in Traverse City, MI.

**Joseph A. DeBarr** participated in a workshop on Adsorbent Carbon, July 1995, in Lexington, KY.

**F. Brett Denny** participated in a scientific meeting on Constraints on Rates of Earthquake Recurrence in the New Madrid Seismic Zone, September 14, 1995, at the Center for Earthquake Research in Memphis, TN. In conjunction with this meeting, he attended a field trip to Benton Hills, September 15, 1995, in Commerce, MO.

**William S. Dey** completed two courses at the University of Illinois-Urbana: Civil Engineering 351: Hydromechanics, fall 1995; and Agricultural Engineering 4966: Groundwater Development for Irrigation and Water Supply, spring 1996.

**Anne L. Erdmann** taught about the geologic factors that may have an effect on and be affected by leaks from underground storage tanks (UST) and the geologic resources available from the ISGS, September 27, 1995, to agencies and consultants involved in UST work during the UST Management Training Course, conducted by the Midwest Environmental and Industrial Health Training Center, School of Public Health, at the University of Illinois-Chicago. Ms. Erdmann also attended a workshop on "Brownfield Law and the Tiered Approach to Cleanup Objectives," May 7, 1996, in Springfield.

**Jeffrey W. Gadt** attended the Fifth annual Symposium on Land-Use, Agriculture, and Environmental Law entitled "New Directions in Environmental Regulations Affecting Development," March 3, 1996, in DeKalb.

**John P. Grube** attended the "Problem Identification Workshop," presented by the Petroleum Technology Transfer Council (PTTC), September 21, 1995, in Grand Rapids, MI; the "Class I Reservoir Workshop," presented by the PTTC, February 27, 1996, in Grayville; and "New Technology Workshop," presented by the PTTC, March 6, 1996, in Evansville, IN. He also participated in the Geographix QLA 2 Exploration Software (log analysis) training course of the PTTC, June 10-11, 1996, in Denver, CO.

**Ardith K. Hansel** taught Segment 1: Glacial and Post-glacial Geology of the Chicago Area for the short course, "Geologic and Hydrogeologic Setting of the Chicago Area," presented by the North-Central Section of the Association of Engineering Geologists, September 22, 1995, in Chicago.

**Manoutchehr Heidari** attended a workshop on the Application of the Hydrogeochem Model to Coal Slurry Deposit Sites," August 18-21, 1995, at the Pennsylvania State University, College Station, PA.

**Jennifer K. Hines** and **Renee J. Nagy** attended the training class in ArcView, March 12-15, 1996, in Champaign.

**Nelson Kawamura** attended a symposium on Current Topics in Tunneling, presented in the 1996 Geotechnical Lecture Series sponsored by the Geotechnical Group of the Illinois Section of the American Society of Civil Engineers

and the Illinois Institute of Technology, February 27, 1996, in Chicago.

**Donald A. Keefer** attended the short course, "Computerized Geostatistical Techniques for Soil Contamination Problems," sponsored by the National Ground Water Association, April 15-16, 1996, in Columbus, OH.

**Latif A. Khan** attended the Powder and Bulk Solids Exhibition, May 8-9, 1996, in Chicago.

**Gregory A. Kientop** attended an eight-hour refresher course for Hazardous Waste Site Workers, presented by the University of Illinois' Institute of Labor and Industrial Relations, January 17, 1996, in Countryside.

**Myrna M. Killey** participated in the fall meeting of the Illinois-Indiana Section of the American Institute of Professional Geologists, November 17, 1995, in Indianapolis, IN, at which she co-presented a session on the Illinois Geologist Licensing Act.

**Ivan G. Krapac, John M. Lytle** and **William R. Roy** attended the Special Research Initiatives retreat, sponsored by the Department of Consumer and Environmental Sciences of the University of Illinois-Urbana, November 6-7, 1995, at Starved Rock Conference Center. Krapac also attended the Illinois Swine Seminar: Environmental Assurance Series, January 17, 1996, in Effingham.

**Robert J. Krumm** and **Donald E. Luman** attended the meeting of the Illinois Geologic Mapping Advisory Committee, October 12, 1995, in Springfield. Krumm also organized and chaired the Mapping Workshop for County Governments, focusing on the ISGS/DCCA County Assistance Project that gives geologic assistance for siting solid-waste disposal facilities. During the workshop, **David L. Gross, Christopher S. McGarry, E. Donald McKay,** and **Renee J. Nagy** also made presentations. **Gross, Krumm, Luman,** and **McGarry** also attended the meeting of the Illinois Mapping Advisory Committee, June 4, 1996, in Champaign.

**Timothy H. Larson, Janis D. Treworgy,** and **Timothy C. Young** attended the symposium on the Application of Geophysics to Engineering and Environmental Problems, April 28-May 2, 1996, in Keystone, CO.

**Zakaria Lasemi** and **C. Pius Weibel** attended the Climate Model Workshop, September 21, 1995, at the University of Iowa.

**Alison B. Lecouris** attended the Midwest ORACLE User's Group Conference, November 20-21, 1995, in Arlington Heights.

**Anthony A. Lizzio** attended a joint meeting of the Illinois Clean Coal Institute and the Research Triangle Institute, September 1995, in Carbondale.

**Donald E. Luman** was session moderator of "The New Satellites" at the summer conference of the Illinois Geo-

graphic Information System Association, June 3-4, 1996, in Champaign. He attended the quarterly meetings of the Illinois Mapping Advisory Committee.

**John M. Lytle** attended the annual meeting of the Illinois Basin Coal Sample Program's Advisory Committee, May 31, 1996, in Carterville.

**Jennifer K. Mattes** completed a graduate geology course, "Surficial Processes," fall 1995, at the University of Illinois-Chicago.

**John M. McBride** and **Janis D. Treworgy** attended the short course, "ArcView Fundamentals, June 5-6, 1996, at the University of Illinois-Urbana.

**Christopher S. McGarry** attended the Dynamic Graphics Eastern Regional User Conference, October 26-27, 1995, in Bethesda, MD.

**Edward Mehnert** attended the workshop on Management of Coal Combustion By-Products, September 26-27, 1995, in Carbondale, and a meeting of Hydraulic Engineers, February 15, 1996, in Urbana.

**Donald G. Mikulic** was an invited participant in the National Science Foundation's workshop on Invertebrate Fossil Collections, June 6-9, 1996, in Washington, D.C.

**James J. Miner** attended the short course, "Using Modflow and Modpath: Groundwater Modeling with a Graphical Interface," November 29-30, 1995, at the University of Wisconsin, Madison.

**Duane M. Moore** attended the short course, "Chemical Weathering Rates of Silicate Minerals," presented by the Mineralogical Society of America, November 3-5, 1995, in New Orleans, LA.

**David G. Morse** was a facilitator for the Problem Identification Workshop, presented by the Petroleum Technology Transfer Council (PTTC), September 21, 1995, in Grand Rapids, MI. He attended the 3-D Seismic Technology Workshop, presented by the PTTC, September 28, 1995, in Grayville, and the Horizontal Drilling Workshop, presented by the PTTC, March 15, 1996, in Grayville. Morse helped with the logistics of the Class I Fluvio-Deltaic Reservoir workshop, presented by the U.S. Department of Energy, February 27, 1996, in Grayville.

**Renee J. Nagy** attended the meeting of the Illinois Geographic Information System Association, February 14, 1996, in Springfield.

**Samuel V. Panno** attended a ground water modeling short course, "Principles and applications of modeling chemical reactions in ground water," May 13-17, 1996, at the International Ground Water Modeling Center, Colorado School of Mines, in Golden.

**Michael A. Phillips** attended Southern Illinois University's Groundwater Forum in Carbondale on September 8 and

October 13, 1995. He attended the short course on Risk-Based Corrective Action, November 1-3, 1995, at the University of Wisconsin in Madison. Phillips completed the course, Environmental Geophysics, spring 1996, at Southern Illinois University-Carbondale. **Phillips** and **Nancy L. Rorick** attended the meeting, May 10, 1996, of the Southern Illinois Geographic Information System Users Group.

**Nancy L. Rorick** attended the Southern Illinois University's Groundwater Forum, October 8, in Carbondale. She attended a meeting at the Illinois Natural History Survey (INHS) with representatives of the Illinois Department of Natural Resources on updating wetland inventory maps, January 22, 1996, in Champaign. Rorick also attended a meeting on the design of the wetland in Saline County with the Illinois Department of Transportation and the INHS, January 31, 1996, in Carbondale. On February 22, 1996, she attended a seminar on the Geographic Information System, sponsored by Southern Illinois University's Library Affairs' Database Seminar Series.

**William R. Roy** attended the seminar, "Bioremediation of Hazardous Waste Sites: Practical Approaches to Implementation," sponsored by the U.S. Environmental Protection Agency, May 29-30, 1996, in Chicago.

**Dale R. Schmidt** attended a seminar on "New Directions in Environmental Regulations Affecting Development," March 21, 1996, at Northern Illinois University-DeKalb.

**Beverly J. Seyler** was a session leader of the Problem Identification Workshop, presented by the Petroleum Technology Transfer Council, September 21, 1995, in Grand Rapids, MI. She attended the Class I Fluvio-Deltaic Reservoir Workshop, presented by the U.S. Department of Energy, February 27, 1996, in Grayville.

**C. Brian Trask** completed the course in Elementary Statistics, fall 1995, at Parkland College, Champaign, and two correspondence courses, "Hazardous Materials—A Citizen's Orientation" and "A Citizen's Guide to Disaster Assistance," from the Emergency Management Institute.

**Emmanuel Udegbumam** attended the Underground Gas Storage seminar presented by the Interstate Oil and Gas Compact Commission, May 7-8, 1996, in Indianapolis, IN.

## Participation in Scientific Conferences and Field Trips

**Michael L. Barnhardt, Leon R. Follmer, Ardith K. Hansel, James C. Hester, Renee J. Nagy,** and **Christopher J. Stohr** attended the meeting and field trip of the Illinois Quaternary Association, April 26, 1996, to the Charleston Quarry, Charleston.

**Robert A. Bauer** attended a one-day field trip during the CUSEC State Geologists' meeting, July 18-19, 1995, to see recent faulting in the Benton Hills area of Missouri, which is one of the first sites in the Midwest to show

faulting that displaces sediments as young as about 10,000 years.

**Subhash B. Bhagwat** and **John M. Masters** attended the annual meeting of the Illinois Association of Aggregate Producers, May 8, 1996, in Springfield.

**Christopher J. Black**, **Ardith K. Hansel**, and **Renee J. Nagy** attended the 30th annual meeting of the North-Central Section of the Geological Society of America, May 2-3, 1996, in Ames, IA. Following the meeting, **Hansel** also attended the field trip, "Hogs, Logs, and Bogs: Quaternary Deposits and Environmental Geology of the Des Moines Lobe," May 4-5, 1996.

**Ross D. Brower** attended the following: the National Ground Water Association's Trade Show and technical sessions, October 28, 1995, in Indianapolis, IN; the Midwest Groundwater Conference, October 16-18, 1995, in Columbia, MO, where he was Conference Historian, and a field trip to the Columbia Missouri Wastewater Treatment Plant and Wetlands in the valley of the Missouri River; and the Action Conference and Exposition of the National Ground Water Association, May 13-15, 1996, in Las Vegas, NV.

**Richard A. Cahill**, **Michael V. Miller**, and **Nancy L. Rorick** attended the 17th annual meeting of the Society of Wetland Scientists, June 9-14, 1996, in Kansas City, MO. **Miller** and **Rorick** also attended the field trip to Haskell-Baker Wetland Complex, June 12, as part of the meeting, and **Rorick** participated in a short course on "Wetland Water Budgets," June 14.

**Madalene R. Tierney Cartwright**, **Keros Cartwright**, **Chen-Lin Chou**, **Heinz H. Damberger**, **Jonathan H. Goodwin**, **David L. Gross**, **Keith C. Hackley**, **Ardith K. Hansel**, **Mary P. Krick**, **Chao-Li Liu**, **Duane M. Moore**, **J. Bruno Risatti**, and **William W. Shilts**, attended the annual meeting of the Geological Society of America and associated societies, November 6-9, 1995, in New Orleans, LA.

**Chen-Lin Chou**, **Heinz H. Damberger**, **Ilham Demir**, **Gwen L. Donnals**, and **John M. Lytle** attended the Illinois Clean Coal Institute's 13th annual Contractors' Technical Meeting, August 8-9, 1995, in Champaign.

**Sheng-Fu J. Chou**, **Gary B. Dreher**, **Ivan G. Krapac**, and **Mary Jane Mushrush** attended the Sixth annual Conference of the Illinois Groundwater Consortium on "Research on Agricultural Chemicals in Illinois Groundwater: Status and Future Directions VI," March 27-28, 1996, in Makanda.

**Joan E. Crockett** and co-author Dale Helpingstine presented a slide show, "History of Oil in Illinois: People, Plays and Technology," at the Illinois Oil and Gas Association's annual meeting, March 7-8, 1996, in Evansville, IN. She contributed written information on petroleum geology and oil-related activities in the Beardstown area to the

guidebook and made a presentation on the subject during the ISGS' field trip for the public, held April 13, 1996, in Cass, Schuyler and Brown counties.

**Ben Brandon Curry** attended the field trip, presented by the Midwest Cell of the Friends of the Pleistocene, June 1-3, 1996, in Grand Forks, ND. During the environmental geology field trip to Charleston and Martinsville, for students April 26, 1996, he led discussions about Quaternary deposits at three stops. For the same class, April 24 and 27, 1996, Curry presented the geology of the Martinsville Alternative Site (ruled out during the state's first attempt to site a low-level radioactive waste facility).

**Heinz H. Damberger** and **Latif A. Khan** attended the annual meeting of the Illinois Mining Institute, of which Damberger was in charge, September 28-29, 1995, in Collinsville. **Damberger**, **James C. Hester**, and **John H. McBride** attended the Illinois Basin Consortium's meeting, January 29, 1996, in New Harmony, IN, to discuss cooperative efforts on the basinwide coal-quality project.

**Thomas E. Davis**, **Zakaria Lasemi**, **John M. Masters**, **John H. McBride**, **David G. Morse**, **Eleanor Prussen**, **Beverly J. Seyler**, and **Emmanuel Udegbunam** attended a field trip on "High-Resolution Sequence Stratigraphy of the Hydrocarbon-Bearing Ste. Genevieve-Downeys Bluff Formations, Illinois Basin," presented by the Illinois Geological Society, April 12, 1996, in the vicinity of Muddy, Illinois.

**Joseph A. DeBarr** and **Gary B. Dreher** participated in the International Ash Utilization Symposium, October 23-25, 1995, in Lexington, KY. DeBarr also participated in the 22nd biennial Conference on Carbon, July 1995, in San Diego, CA, and the Second Conference on Unburned Carbonaceous Material on Utility Fly Ash, March 5-6, 1996, in Pittsburgh, PA.

**F. Brett Denny** attended a field trip to the Southwestern USA Ore Deposits in Colorado, Utah, Nevada and Arizona, March 9-17, 1996, as part of a course in Advanced Economic Geology at Southern Illinois University-Carbondale.

**Anne L. Erdmann** attended the 16th annual Superfund Conference, November 6-8, 1995, in Washington, D.C.

**Leon R. Follmer** led a field trip for the Illinois Soil Classifiers Association, September 15, 1995, in Adams County.

**Anthony M. Foyle**, **Christine S. Fucciolo**, **Jennifer K. Hines**, **Christopher S. McGarry**, **Jennifer R. Ousley**, **Richard J. Rice**, **Matthew H. Riggs**, **C. Brian Trask**, **Colin G. Treworgy**, and **C. Pius Weibel** attended the Midwest-Great Lakes ARC/INFO User Conference, September 26-29, 1995, in Champaign. **Foyle**, **Fucciolo**, **McGarry**, **Trask**, and **Janis D. Treworgy** also participated in the Pre-Conference ArcView Workshop, September 26, 1995.

**David A. Grimley**, assisted by **Daniel C. Barnstable**, lectured to personnel from the Kane County and the St.



Charles Forest Preserves on "The Glacial Geology of Kane County," May 10, 1996, in St. Charles.

**John P. Grube** attended the following meetings of the Illinois Geological Society: September 14, 1995, in Mt. Vernon; October 19, 1995, in Grayville; combined meeting with the Indiana/Kentucky Geological Society and the Society of Petroleum Engineers, November 16, 1995, in Grayville; combined meeting with the Indiana/Kentucky Geological Society, January 18, 1996, in Grayville; February 15, 1996, in Olney; and combined with the Society of Petroleum Engineers, March 14, 1996, in Grayville. He presented the petroleum aspects of the "Warsaw" at an evening presentation, October 6, and during a field trip, October 7, 1995, on the "Waulsortian-Type Mounds to Storm-Generated Sand waves: Middle Mississippian Ullin ('Warsaw') and Fort Payne Carbonates," at the Field Conference of the Great Lakes Section of the Society of Economic Paleontologists and Mineralogists, at Giant City State Park. For the Illinois Geological Society, he organized a field trip on "High Resolution Sequence Stratigraphy of the Hydrocarbon-Bearing Ste. Genevieve-Downey's Bluff Formations, Illinois Basin," presented April 12, 1996, at the Martin Marietta and Hardin County Materials Quarries near Cave-in-Rock. **W. John Nelson** was co-leader and **Janis D. Treworgy** was coordinator of logistics for the event.

**Ardith K. Hansel** participated in the Midwest Glaciology Meeting, April 19, 1996, in DeKalb, and the 14th biennial Meeting of the American Quaternary Association, May 20-22, 1996, in Flagstaff, AZ. In conjunction with the Scientific Literacy Program on Wetlands for middle grade teachers, July 12, 13, and 17, 1995, she presented three slide-show talks on the formation of glacial wetlands in northeastern Illinois and led demonstrations of hands-on activities to use with students to show glacial erosion, deposition, and the formation of kettle holes and then led field trips to Volo Bog each day to show the teachers the glacial geology of the area.

**Beverly L. Herzog** moderated a session of the Sixth annual Conference of the Illinois Groundwater Consortium on "Research on Agricultural Chemicals in Illinois Groundwater: Status and Future Directions VI," March 27-28, 1996, in Makanda. She also co-taught a short course entitled "Fundamentals of Environmental Sampling," January 30-February 1, 1996, in San Diego, CA.

**James C. Hester** attended the combined meeting of the Illinois, Indiana and Kentucky Geological Surveys to discuss the Wabash Valley Seismic Map, February 15, 1996, in Bloomington, IN. **Hester** and **Colin G. Treworgy** participated in the winter conference of the Illinois Geographic Information System (GIS) Association, February 14, 1996, in Springfield. **Hester**, **Jennifer K. Hines**, and **Robert J. Krumm** attended the summer conference of the Illinois GIS Association, June 3-4, 1996, in Champaign.

**Bryan G. Huff**, **Zakaria Lasemi**, **Rodney D. Norby**, and **Janis D. Treworgy** led the field trip, "Depositional history

of the middle Mississippian Ullin ('Warsaw') and Fort Payne formations: from Waulsortian mounds to storm-generated sand waves," of the Great Lakes Section of the Society for Sedimentary Geology, October 6-7, 1995, in southern Illinois and western Kentucky. Other participants from the ISGS included **Chou**, **Jonathan H. Goodwin**, **Dennis R. Kolata**, **Nancy L. Rorick**, and **C. Pius Weibel**. Huff also presented a field trip on the "Geology of Illinois," October 21, 1995, and another on the "Petroleum Geology of Illinois: History and Occurrence in Clark, Cumberland and Coles Counties," November 11, 1995, for the Department of Geology, University of Illinois-Urbana. He attended the Society of Petroleum Engineers and the Department of Energy's 10th Symposium on Improved Oil Recovery, April 21-24, 1996, in Tulsa, OK. At the invitation of Dr. Da Ri Wang, Head of Geochemical Analyses, he visited and toured the Chinese National Petroleum Research Institute, May 11, 1996, in Beijing, China.

**Ivan G. Krapac** attended the 87th annual meeting of the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, October 29-November 3, 1995, in St. Louis, MO.

**Robert J. Krumm** attended the summer meeting of the Illinois Geographic Information System Association, August 25, 1995, in Champaign. He presented opening remarks, moderated a session and convened the closing session of the Midwest-Great Lakes ARC/INFO User Conference, September 26-29, 1995, in Champaign. Krumm also served as a class assistant for a one-day GIS software workshop held in conjunction with the meeting, September 25.

**David R. Larson** and **Edward Mehnert** attended the fall meeting of the Illinois Groundwater Association (IGA), October 20, 1995. Larson attended the 1996 spring meeting of IGA, March 21, 1996, in Batavia.

**Timothy H. Larson** and **Wen-June Su** attended the 91st annual meeting of the Seismological Society of America, April 1-3, 1996, in St. Louis, MO. Dr. Larson also spoke on earthquakes in southern Illinois at the ISGS' geological science field trip, October 28, 1995, in the Carbondale area.

**Zakaria Lasemi** presented the talk, "Reservoir development in the Warsaw carbonates of the Illinois Basin," at the joint meeting of the Illinois Geological Society, Society of Petroleum Engineers, and the Indiana-Kentucky Geological Society, November 16, 1995, in Evansville, IN.

**Anthony A. Lizzio** participated in the meetings of the Executive Committee of the Fuel Chemistry Division of the American Chemical Society, August 20-24, 1995, in Chicago.

**Donald G. Mikulic** led field trips to view the Silurian reef exposed in Material Service Corporation's Thornton quarry

for the Chicago Academy of Sciences in September 1995 and May 1996.

**James J. Miner** was a member of a panel discussing the hydrogeology of fens at the annual meeting of the Society of Wetlands Scientists, June 10-14, 1996, in Kansas City, MO. He attended a field trip to the Iowa fens in conjunction with the annual meeting of the North-Central Section of the Society of Wetlands Scientists, August 26-27, 1995, in Lake Okoboji, IA.

**Duane M. Moore** attended the 33rd annual meeting of the Clay Minerals Society, June 15-20, 1996, in Gatlinburg, TN.

**David G. Morse** attended the annual meeting of the American Association of Petroleum Geologists, May 19-22, 1996, in San Diego, CA. He also attended the annual meeting of the Illinois Oil and Gas Association, March 7-8, 1996, in Evansville, IN; and the annual meeting of the Kentucky Oil and Gas Association, June 11-12, 1996, in Owensboro, KY. Morse attended the field trip on building stone quarries (Salem Limestone), November 13, 1995, presented by the Indiana State Geological Survey in Bloomington, IN.

**Daniel O. Nelson** served as a panelist on Metadata/Documentation at the winter conference of the Illinois Geographic Information System Association, December 4-5, 1995, in Schaumburg.

**Richard J. Rice** attended the annual meeting of the Illinois Specialty Growers Association, January 8-9, 1996, in Decatur; and the meeting of the Illinois Association of Groundwater Professionals, March 25-26, 1996, in Peoria.

**Massoud Rostam-Abadi** attended the annual meetings of the American Chemical Society, August 20-25, 1995, in Chicago, and March 24-28, 1996, in New Orleans, LA. He organized and chaired two sessions for a symposium on "Marketable Products from FGD Residue and Fly Ash" for the March meeting.

**Beverly J. Seyler** attended the meetings of the Illinois Geological Society in September and October 1995 and February and April 1996 and the meeting of the Illinois Basin Consortium, March 22, 1996, in Bloomington, IN.

## Lectures/Classes/Seminars Taught/Advising Graduate Students

**Richard C. Berg** lectured on "Environmental Geology and Aquifer Mapping," September 29, 1995, to members of a class in Hydrogeology at the University of Illinois-Urbana.

**Richard A. Cahill** serves on the dissertation committee for 1998 Ph.D. candidate **Xiaoning Zhu**, Department of Geography, University of Illinois-Urbana, on the "Variability of Trace Metals and Grain Size in Copper Slough Sediments."

**Mark P. Cal** is teaching Civil Engineering 449: Techniques in Instrumentation and Air Sampling, fall 1996, at the University of Illinois-Urbana. He is advising two graduate students, whose research projects are entitled "Preparation of carbon molecular sieves for oxygen separation from air" and "Preparation of novel carbon sorbents for hot gas cleanup," in the Environmental Engineering and Science Program at the University of Illinois-Urbana.

**Michael J. Chrzastowski** conducted a one-day field trip along Illinois' coast of Lake Michigan for students in the Environmental Geology course, fall 1995, at DePaul University in Chicago.

**Ben Brandon Curry** advised graduate student **Jason Mann** from the Department of Geology, University of Manitoba, on "Paleolimnology of paleolagoons of Lake Agassiz, central Canada."

**Heinz H. Damberger** gave five lectures on coal during fall 1995 and five during spring 1996, to a class in the "Geology of Energy Resources" at the University of Illinois-Urbana. He also organized and led a field trip for the class on August 29, 1995, to the Captain (surface coal) Mine in Perry County. On February 19, 1996, and several other times throughout the academic year, Damberger had extended meetings with **Georg Grathoff**, a Ph.D. candidate in the Geology Department of the University of Illinois-Urbana, on the maturation of organic materials, especially coal; maturation patterns in the Illinois Basin; and their geologic interpretation and limitations.

**Leon R. Follmer** lectured to students on research methods in loess studies, August 27, 1995, in Geography 357 at the University of Illinois-Urbana. He is a member of the academic committee, supervising special credit courses and consulting on research design and interpretations for the following students from the University of Illinois-Urbana: **David L. Grimley**, Ph.D. completed, on "magnetic susceptibility studies in loess;" David Voorhees, Ph.D. in progress, on "Genesis of glacial stone pavement;" and Blake Snodsmith, completed, undergraduate special study of "Cache Valley terrace deposits," all in the Department of Geology; Larry Abbott, Ph.D. in progress, on "Genesis of soils in post-glacial loess in Illinois," in the Department of Geography; **Christopher J. Stohr**, Ph.D. completed, on "Remote sensing of landfill covers," Department of Agronomy; and **Hong Wang**, Ph.D. completed, on "Stable isotope study of paleosols in loess," Department of Anthropology. He also is supervising David Labrecque, M.S. in progress, on "Quaternary terraces of the eastern Cache Valley," Department of Geology at Southern Illinois University-Carbondale.

**Keith C. Hackley** lectured on "Recent Applications of Environmental Isotopes to Landfill Situations" for Geology 355: Groundwater Hydrology in the Department of Geology at the University of Illinois-Urbana. He also spoke on "Tritium Analysis for Groundwater Study" at

the 62nd annual conference of the Southern Illinois Water Operators' Association, May 23, 1996, in Flora.

**Ardith K. Hansel** provided informal advice to University of Illinois Geology Ph.D. candidate David Voorhees on his dissertation research, "Genesis and implications of stone beds in terrestrial glacial sequences."

**Manoutchehr Heidari** gave informal advice to University of Illinois Civil Engineering Ph.D. candidate **Edward Mehnert** on his dissertation research, "Estimation of Aquifer Parameters from Water Fluctuations in a Well," and provided informal advice and data to University of Illinois graduate student Michael Ham for his research on, "Development of an Efficient Scalable Algorithm for the Solution of Large Systems of Linear Equations Arising from the Numerical Solution of Groundwater Problems."

**Bryan G. Huff** provided extensive assistance, on an informal basis, to **Jianzhong Xu** on his Master's thesis for the Department of Geology, University of Illinois-Urbana.

**Hue-Hwa Hwang** gave a seminar, "Source of Saline Groundwater in Basal Pennsylvanian Sandstone, Southwestern Illinois: Implications for Fluid Mixing and Water-Rock Interactions," March 27, 1996, in the Department of Geology, University of Illinois-Urbana.

**Russell J. Jacobson** led two dinosaur digs during July 1995, recruiting crews of 12 to 15 people for each. One was a cooperative venture for two weeks with the South Dakota School of Mines near Sundance, WY, in the Upper Jurassic Morrison Formation. The other was a dig in the Upper Cretaceous Hell Creek Formation of South Dakota, from which the field party recovered abundant dinosaur and other reptilian remains for the University of Illinois' Museum of Natural History. To the participants, Jacobson, and co-leader Steve Sroka taught vertebrate paleontology field techniques, including the recognition of fossil bone, types of dinosaurs and other vertebrates in Hell Creek, and methods for the excavation, preservation and removal of vertebrate material.

**Paul C. Jahn** demonstrated the Global Positioning System to 20 representatives of the Department of Natural Resources' Grants and Administration Office, June 20, 1996, in Springfield.

**Myrna M. Killey** presented the lecture, "Illinois' Ice Age Geology," in the World of Science Lecture Series, October 6, 1995, at Parkland College-Champaign, and taught two sessions of an introductory geology short course for members of the ISGS' support staff, July 1995 and September-October 1995. She lectured on "Geology of Illinois" to students in Agriculture 199: Illinois Wilds: the Natural History of Illinois, September 5, 1995, at the University of Illinois-Urbana. Killey and **Robert C. Vaiden** were among co-teachers of Parkland College's one-week field geology course, August 1995. Killey led a half-day field trip on Champaign County's geology for an introductory class in geology at Parkland College, December 2, 1995. She,

**Wayne T. Frankie** and **Russell J. Jacobson** co-led a special field trip for 160 students from Pontiac High School, Cornell Middle School, and Midland High School in the Pontiac-Streator area, September 8, 1995; and co-led the same field trip for the public, September 9, 1995.

**Dennis R. Kolata** presented the lecture, "Did Laurentia and Gondwana Collide during the Ordovician," December 1, 1995, for the Friday Colloquium Series, sponsored by the Department of Geology at the University of Illinois at Urbana-Champaign. He also provided informal advice to the following graduate students on the following topics: Judy Becker, depositional environments of the Mifflin Formation in northern Illinois; **Georg Grathoff**, the Maquoketa Group in the Illinois Basin; Junshe Liu, nature and origin of K-feldspar alteration of uppermost Precambrian rocks in west-central Wisconsin; Tim Paulsen, origin and tectonic significance of the Uinta reentrant in the Sevier Fold-Thrust Belt, Utah, and **Christopher S. McGarry**, fracture analysis of the Platteville and Galena aquifer in northern Illinois, all from the Department of Geology, University of Illinois at Urbana-Champaign. Dr. Kolata also advised Douglas McVey on constraining Middle Ordovician volcanicity in the Iapetus Ocean area using products of eruptive volcanism, Department of Geology, University of Cincinnati; and Thomas H. Shaw, Early Middle Ordovician evolution of the Illinois Basin, Department of Geology, Queens College, New York, NY.

**Ivan G. Krapac** advised Jose Sananes Sangros on a special research project, "Evaluation of one dimensional advective-dispersive contaminant transport model predictions for a field-scale earthen liner," for his M.S. degree in Civil Engineering from the University of Illinois-Urbana.

**Robert J. Krumm** presented an introduction to the Geographic Information System (GIS), including examples on how the technology has been used to address environmental problems, and gave an on-line demonstration of digital databases for Illinois and GIS applications, October 30, 1995, to students in a Pedology class at the University of Illinois-Urbana.

**Timothy H. Larson** presented six lectures and a field demonstration on various geophysical methods to students in Geology 351: Introduction to Geophysical Methods, April-May 1996, for the Department of Geology, University of Illinois at Urbana-Champaign.

**Zakaria Lasemi** presented the talk, "Middle Mississippian Ullin and Fort Payne Formations: Depositional History, Sequence Stratigraphy and Reservoir Development," on April 5, 1996 for the Friday Colloquium of the Department of Geology, Southern Illinois University-Carbondale. He is advising Bill Ferry, a graduate student in the Department of Geology, Southern Illinois University-Carbondale, on his research on "Petrography, paleontology, and depositional history of a Mississippian carbonate mud-mound, southern Illinois."

**Chao-Li Liu** lectured on "Introduction to Radiocarbon Dating," February 7, 1996, to honor students in the Anthropology Department at the University of Illinois at Urbana-Champaign.

**Anthony A. Lizzio** advised the following graduate students from the University of Illinois at Urbana-Champaign:

**Joseph A. DeBarr**, Ph.D. candidate, on his SO<sub>2</sub>/NO<sub>x</sub> project in Environmental Science; Jian Sun, Ph.D. candidate, on his natural gas storage project in Environmental Engineering; and Michael Daley, Ph.D. completed, August 1996, in Materials Science and Engineering.

**Donald E. Luman** gave an invited lecture, "Development of the Illinois Land Cover Inventory," December 13, 1995, in the Department of Anthropology and Geography, University of Illinois-Chicago.

**John M. Masters** consulted with a new student and his advisor concerning possible research topics on the Mounds Gravel in the Department of Geology at the University of Illinois at Urbana-Champaign.

**Jennifer K. Mattes** lectured on Environmental Site Assessments to the Geology Club, August 29, 1995, at the University of Illinois-Chicago.

**John H. McBride** presented five lectures in Geology 351: Geophysical Methods, March-April 1996, at the University of Illinois-Urbana. He lectured on "The origin of dipping reflector structures in the crust and upper mantle beneath the British Caledonides," April 16, 1996, at Cornell University, Ithaca, NY; on April 22, 1996, at Indiana University-Bloomington; and again on April 26, 1996, at the University of Illinois at Urbana-Champaign. He also gave the lecture, "Possible seismogenic structure in the Wabash Valley seismic zone: preliminary observations from seismic reflections data," April 22, 1996, at Indiana University-Bloomington.

**Edward Mehnert** lectured on "Pesticides in Groundwater," September 8, 1995, to students in Geology 355 at the University of Illinois-Urbana.

**Duane M. Moore** served on the dissertation committee of **Georg Grathoff**, who defended his thesis, May 29, 1996, based on his research project on "Mineralogical characterization of the Maquoketa Group and the use of this characterization for historical reconstruction," Department of Geology, University of Illinois at Urbana-Champaign.

**David G. Morse** lectured on eolian deposits to students in the Sedimentology class, March 18, 1996, in the Department of Geology, University of Illinois at Urbana-Champaign. He also made a presentation on fluvial deposits and led general outcrop discussions concerning sedimentary structures and sedimentary environments in southern Illinois outcrops, March 29, 1996, during a field trip for students in the Stratigraphy class.

**Daniel O. Nelson** lectured on "Siting a Low-Level Radioactive Waste Disposal Facility in Illinois," October 27, 1995,

at the Department of Geological Sciences, University of Illinois-Chicago.

**Samuel V. Panno** presented the lecture, "Geology and Hydrogeology of Illinois Caverns," and led a tour of caverns for 120 teachers from the Illinois Rivers Project, in Waterloo. He lectured on "Geology, Hydrogeology, and Groundwater Contamination in Karst Terrain," and helped teach middle school teachers at the Illinois Middle School Ground Water Project, October 20, 1995, in Columbia. Panno presented the lecture, "Geology and Hydrogeology of Southwestern Illinois Karst Regions," to the Windy City Grotto of the National Speleological Society, December 13, 1995, at the Field Museum in Chicago. On April 18, 1995, he presented the talk, "Geology, Hydrogeology, and Groundwater Contamination in Karst Terrain of Southwestern Illinois," to Southern Illinois University's Groundwater Forum, sponsored by the Southern Illinois Groundwater Consortium in Carbondale. Panno also presented the lecture, "Geology and Hydrogeology of Illinois' Sinkhole Plain," and led a tour of caverns for 30 participants of the Illinois Chapter of the Soil and Water Conservation Society, June 14, 1996, in Waterloo. He assisted Heb Hamamo in field work and laboratory experiments for her M.S. thesis, "Phosphate Fertilizer Industry and Its Impact on the Environment," completed August 1995, in the Department of Nuclear Engineering at the University of Illinois-Urbana.

**Michael A. Phillips** taught the following courses at Shawnee Community College in Ullin: Astronomy 111, fall 1995 and spring 1996, and Geology 215: Environmental Geology, spring 1996.

**James B. Risatti** advised Stan Zagula, Ph.D. student in the Civil Engineering Department, Northwestern University in Evanston, on his research on, "An Evaluation of Column Flotation for Remediation of Sediments Containing Non-Polar Organic Contaminants"

**Massoud Rostam-Abadi** has worked with graduate students in Environmental Science and Engineering at the University of Illinois at Urbana-Champaign on the following projects: two M.S. students, one of whom completed work in November 1995; on "Development of Adsorbent Carbons from Scrap Tires for Natural Gas Storage;" as faculty research advisor for a Ph.D. candidate studying "Production of Adsorbent Carbon from Illinois Coal for Natural Gas Storage;" as faculty research advisor and a member of Ph.D. Committee for a Ph.D. candidate studying "Coal-Based Activated Carbon for Mercury Vapor Control;" as faculty research advisor and member of Ph.D. Committee for a Ph.D. candidate studying "Regeneration of Activated Carbon;" and as member of the Ph.D. Committee for a Ph.D. candidate studying "Development of an Activated Carbon Fiber Cryogenic System to Recover and Reuse Toxic Organic Vapors."

**William R. Roy** gave two lectures in the course Soils 311: Laboratory Methods for Soil Research, September 19 and 21, 1995, on "Inductively coupled argon plasma-atomic

emission spectroscopy" and "Methods for collection adsorption and desorption data" at the University of Illinois-Urbana. He is a member of the Ph.D. committees for C. Xu on the "Influence of the soil oxidation state on the behavior of agricultural chemicals" and D. Hou on "Infrared Spectroscopic Investigation of Iron Redox Reactions in Clays" in the Department of Natural Resources and Environmental Sciences at the University of Illinois-Urbana.

**Gary L. Salmon** is advising Sami Abdel Bagi, a Ph.D. candidate studying "Anthropogenic biomarkers of combustion products on an urban river system" in the Department of Geology, College of Science, Southern Illinois University-Carbondale; and Paritosh Desai, a master's degree candidate studying "Production of Struvite in Waste Water Digestion Processes" in the Department of Chemical Engineering, Illinois Institute of Technology.

**Michael L. Sargent** led a field trip to the meteorite impact site at Kentland, IN, September 9, 1995, for students of Professor McGlaughlin at the University of Illinois at Urbana-Champaign. He assisted in teaching two laboratory sessions on carbonate and clastic sedimentary rocks in cored sedimentary successions for the sedimentology-stratigraphy class and he advised two students on senior honors theses on "The Des Plaines Disturbance: a meteorite impact site" in the Department of Geology at the U of I.

**Edward C. Smith** presented a lecture and slide show on "Karst in Illinois: Groundwater resources and contamination potential of karstic terrains," March 27, 1996, for students in Geology 380: Current Issues in Environmental Geology at the University of Illinois at Urbana-Champaign.

**Christopher J. Stohr** gave a lecture and in-class laboratory exercise on the use of remote sensing in "Precision Farming," April 18, 1996, for a class in Agricultural Engineering 300: Precision Farming, at the University of Illinois-Urbana. He gave a talk on the "Classification of Infiltration in Depressions Using Remote Sensing," at the meeting of Chi Epsilon, the Civil Engineering Honors Fraternity at the University of Illinois, March 6, 1996, in Urbana.

**Janis D. Treworgy** assisted four graduate students with their thesis research topics for Professors Stephen Marshak at the University of Illinois-Urbana and Fred Read at Virginia Tech.

**Robert C. Vaiden** teaches an Introductory Earth Science class, fall and spring semesters, and is one of three instructors for a Geology Field Course at Parkland College, Champaign.

## Offices/Committee Memberships/ Services for Professional/ Educational Societies

**Robert A. Bauer** is the Rock Mechanics Chairman for the North-Central Section of the Association of Engineering Geologists (AEG). He is also Manager of the National Rock Mechanics Committee and a member of the National Subsidence Committee of AEG.

**Richard C. Berg** is continuing to serve as a member of a working group for the American Society for Testing and Materials developing a standard guide for selecting methods for assessing aquifer sensitivity and vulnerability.

**Ross D. Brower** is Historian of the Midwest Groundwater Conference, an office he has held since 1982.

**Richard A. Cahill** is a reviewer for the American Chemical Society's *Journal of Environmental Science and Technology*, the International Association for Great Lakes Research, *Ground Water Monitoring and Remediation*, and the International Water Resources Association. For the University of Illinois-Urbana, he is a member of the Board of Trustees of the Museum of Natural History, a member of the Radiation Safety Committee, and an advisor/analyst on the Program on Ancient Technologies and Archaeological Materials.

**Mark P. Cal** reviewed approximately 10 papers for student awards given by the Environmental Division of the American Institute of Chemical Engineers.

**Chusak Chaven** is Chair Person of the American Society for Testing and Materials' Coal Sample Database Subcommittee and a member of the task group for Methods for Fluorine in Coal.

**Chen-Lin Chou** reviewed a paper for the *International Journal of Coal Geology* and one chapter of a book for the Geological Society of America. He hosted three visiting geologists—Dr. Daiyong Cao, Dr. Yanbin Wang, and Mr. Zhongkai Chen, all from the Beijing Graduate School of China, University of Mining and Technology, during August-September 1995, while they conducted a research project comparing the geochemistry of coals from the Illinois Basin and the Turpan Basin of China.

**Mei-In Melissa Chou** reviewed a manuscript, "Application of XAFA spectroscopy to coal geochemistry," for the Geochemical Society's Special Memorial Volume in Honor of Roger G. Burns. She is a member of the American Chemical Society, its Divisions of Geochemistry and Fuel Chemistry, and the American Association of Petroleum Geology.

**Sheng-Fu J. Chou** reviewed a manuscript for the *Journal of Environmental Quality*.

**Heinz H. Damberger** is a member of the Editorial Board of the *International Journal of Coal Geology*, for which he reviewed five papers during the year. As Secretary-Treasurer of the Illinois Mining Institute (IMI), he organizes and runs the annual meetings, prepares two Executive Board meetings, works with committee chairmen, works with and prepares the president for meetings, helped the 1995 Program Committee organize and implement the program, and edited the 1995 IMI Proceedings. Damberger is a member of the Research and Development Committee of the Coal Division of the Society of Mining Engineers of the American Institute of Mining, Metallurgical and Petroleum Engineers.

**Leon R. Follmer** is a member of the Editorial Board of the Journals *Catena* and *International Journal of Soil Science, Hydrology, and Geomorphology* and a member of the International Editorial Advisory Board of the *Journal of Quaternary Science*. For the International Union for Quaternary Research, he is President of the North American Loess Working Group and Secretary-Treasurer of the Paleopedology Commission. Follmer is an adjunct member of the geology faculty at Southern Illinois University for graduate student examination committees.

**John P. Grube** is serving as Vice President (Program Chairman) of the Illinois Geological Society (IGS) from September 1995 through September 1996. He has organized all meetings and field trips in this capacity. He also helped organize the Petroleum Technology Transfer Council's "Horizontal Drilling Workshop," most of which he initiated for the IGS.

**Ardith K. Hansel** is a member of the Management Board of the North-Central Section of the Geological Society of America (GSA), a position she has held since 1994 and will continue through 1997. This board plans and finds hosts for meetings. She has been a panel member, 1993-1995, of the Quaternary Geology and Geomorphology Division (QG&G) of the GSA, which plans divisional activities at GSA meetings and is liaison with other Quaternary and geomorphology organizations and societies. Hansel was elected to serve as the QG&G Division's Second Vice-Chair, 1997; 1st Vice-Chair, 1998; and Chair, 1999. Hansel is the Executive Officer and Secretary, 1995-1999, of the International Quaternary Association's Commission on Glaciation, which reviews proposals and submits them for funding, prepares and distributes the commission's newsletter and, with working groups, plans field meetings throughout the world. For the Illinois Quaternary Association, she planned and co-hosted the 1996 spring meeting and field trip. For the American Quaternary Association (AmQuA), she audited the Treasurer's books and reported to the AmQuA Council, summer 1996. From 1990 to the present, she has been a technical review panelist, reviewing project proposals for the Great Lakes Protection Fund.

**Beverly L. Herzog** has served on the Certified Ground Water Professionals Subcommittee of the Education

Committee of the National Ground Water Association from 1994-1996. From 1989 to the present, she has been a member of the Editorial Board of the journal *Ground Water Monitoring Review*, for which she reviewed four papers. She also reviewed two papers for *Ground Water* and two papers for *Water Resources Bulletin*, the journal of the American Water Resources Association.

**Jennifer K. Hines** was a member of the Organizing Committee for the annual meeting of the Midwest-Great Lakes ARC/INFO User Group, September 26-29, 1996, in Champaign, and is Chairman of the group's Training Committee.

**Bryan G. Huff** has served on the Board of Governors of the Illinois Geological Society from September 1994 to the present.

**Randall E. Hughes** served as a Managing Editor of the journal *Applied Clay Science* for the Clay Minerals Society until January 1996, and continues to serve as an Associate Editor.

**Myrna M. Killey** is an advisory member of the Executive Committee of the Illinois-Indiana Section of the American Institute of Professional Geologists, for which she attended a meeting, September 29, 1995, in Covington, IN.

**Dennis R. Kolata** has been appointed to the Editorial Advisory Board of the American Geological Institute from 1996-1999.

**Robert J. Krumm**, with others, organized a Geological Society of America (GSA) Theme Session, "Geographic Information Systems and Integrated Digital Databases: Tools for Geoscience Analysis," for the annual meeting of the GSA held in Denver, October 28-31, 1996.

**David R. Larson** is serving as Vice-Chair of the Illinois Groundwater Association (IGA) and Chair of the Groundwater Science Awards Committee of the IGA from January 1995-December 1996.

**Timothy H. Larson** is serving as Chairman of the Public Affairs Committee of the Environmental and Engineering Geophysics Society from 1994-1996 and as Treasurer of the International Water Resources Association from 1995-1996.

**Zakaria Lasemi** reviewed two manuscripts for the European journal, *Sedimentology*, and jointly reviewed a cross section for the Indiana Geological Survey with **Janis D. Treworgy**.

**Haines E. Later** is Chairman of the Computer Committee of the Society of Economic Paleontologists and Mineralogists (Society for Sedimentary Geology) for 1996-1997.

**Anthony A. Lizzie** organized the symposium on "Production and Use of Carbon-Based Materials for Environmental Cleanup" and chaired seven technical sessions, comprising 55 papers, at the 211th national meeting of the

American Chemical Society (ACS), March 24-28, 1996, in New Orleans, LA. From 1995-1998, he is serving as Editor of the newsletter published twice a year by the Fuel Chemistry Division of the ACS and serves on the Publications, Public Outreach and Policy subcommittees of the society. He also serves on the Executive Committee of the Fuel Chemistry Division of ACS, attending meetings held during the national meetings of ACS, August 20-24, 1995, in Chicago, and March 24-28, 1996, in New Orleans, LA. He reviewed two papers for *Carbon Journal*.

**John H. McBride** serves on the Editorial Board of the *Journal of Geophysical Research*. He reviewed papers for *Nature* and the *Journal of the Geological Society of London*.

**Edward Mehnert** reviewed three manuscripts for *Ground Water*.

**Donald G. Mikulic** has been Co-Chair of the Committee on Collections of the Paleontological Society since February 1996. He also reviewed two grant proposals for the National Science Foundation.

**Michael V. Miller** is serving as Vice President of the North-Central Division of the Society of Wetland Scientists from June 1, 1996-May 30, 1998.

**Duane M. Moore** has been Historian of the Clay Minerals Society since 1993.

**David G. Morse** serves on the Research Committee of the American Association of Petroleum Geologists. He reviewed three papers for the *American Association of Petroleum Geologists Bulletin*.

**Daniel O. Nelson** served as Committee Secretary for the Midwest-Great Lakes ARC/INFO User Conference, September 26-29, 1995, in Champaign.

**Rodney D. Norby** reviewed a manuscript for the *Journal of Paleontology*.

**Samuel V. Panno** reviewed three manuscripts for the journal, *Ground Water*. He was a reviewer of a proposal entitled "Leaching behavior patterns of heavy metals from phosphogypsum" to the Florida Institute of Phosphate Research.

**Russel A. Peppers** is a member of the Midcontinent Pennsylvanian Stratigraphic Working Group for the Society of Economic Paleontologists and Mineralogists (Society for Sedimentary Geology).

**James B. Risatti** reviewed two manuscripts for the Deep Sea Drilling Project and one chapter for a geology textbook.

**Massoud Rostam-Abadi** was appointed to the International Advisory Board of the Asia-Pacific Conference on Sustainable Energy and Environmental Technology, June 18-20, 1996, in Singapore. He was elected by the Fuel and Petrochemical Division of the American Institute of Chemical Engineers (AIChE) to be the Program Coordinator for the 1996 annual AIChE meeting in Chicago. Rostam-Abadi is Quest Editor of the *Journal of Gas Separation and Purification*.

**William R. Roy** is Associate Editor, from January 1994-December 1997, of the *Journal of Environmental Quality*, for which he reviewed, edited or processed 15 manuscripts and attended a meeting of the Editorial Board, October 30, 1995. Through December 1998, he is a member of the Editorial Board of the *Journal of Hazardous Materials*, for which he reviewed and edited six manuscripts.

**Gary L. Salmon** is a member of the Contaminated Aquatic Sediments Specialist Group of the International Association on Water Quality and program advisor to the Central Illinois Section of the American Chemical Society.

**Michael L. Sargent** is the institutional representative for the Geological Society of America at the ISGS, providing information about, and promoting, membership in the organization.

**Christopher J. Stohr** is Chair of the Remote Sensing Committee of the Association of Engineering Geologists. He reviewed an article for *Photogrammetric Engineering and Remote Sensing* of the American Society of Photogrammetry and Remote Sensing.

**Colin G. Treworgy** is a member of the Board of Certification, Division of Professional Affairs, of the American Association of Petroleum Geologists.

**Janis D. Treworgy** was Vice President of the Great Lakes Section of the Society of Economic Paleontologists and Mineralogists (Society for Sedimentary Geology), fall 1994-fall 1995, during which she coordinated and ran the 1995 Fall Field Conference. She is a charter member of the Board of Trustees for the Museum of Natural History at the University of Illinois at Urbana-Champaign.

**Emmanuel Udegbumam** reviewed a manuscript for the *Journal of Petroleum Science and Engineering*.

**C. Pius Weibel** is serving as Secretary of the Great Lakes Section of the Society of Economic Paleontologists and Mineralogists (Society for Sedimentary Geology) from fall 1994-summer 1998.

# Contributions to Other Government Agencies

## Testimony/Information Supplied to Local/State/National Agencies/Committees

**Robert A. Bauer, David L. Gross and Janis D. Treworgy** provided information on the regional bedrock geology of Illinois and the area surrounding Fermilab to a planning group at the Fermi National Accelerator Laboratory, April 10, 1996, in Batavia.

**Richard C. Berg** provided a deposition for the Illinois Pollution Control Board on the definition of the word "stratigraphy" and how it applies to assessments for characterizing sites of leaking underground storage tanks, April 25, 1996, in Urbana.

**Beverly L. Herzog** presented "Aquifer Characterization Study of Southwest McLean and Southeast Tazewell County" to the City Councils of Normal and Bloomington, October 30, 1995, and the Central Planning Region's Groundwater Protection Committee, May 14, 1996, in Tremont.

**Bryan G. Huff** gave a deposition, January 26, 1996, regarding Mississippian and Pennsylvanian stratigraphy, nomenclature and log interpretation in the case of Baldwin versus Smith for the Circuit Court of Lawrence County, Lawrenceville.

**Robert J. Krumm and Melisa McLean** presented information on the County Assistance Project, explaining the importance of geologic mapping to siting of solid-waste facilities to the members of the McLean County Board, October 30, 1995.

**David R. Larson** presented progress reports on the study of the hydrogeology of the glacial drift in DeWitt and Piatt Counties to the Mahomet Valley Water Authority, November 3, 1995, and March 1, 1996, in Monticello. He presented information on hydrogeology of the glacial drift aquifers in southeastern Tazewell and southwestern McLean Counties at the meeting of the MacKinaw Valley, Danvers, and Pleasant Valley Water Authorities, November 15, 1995, in Mackinaw.

**Donald E. Luman** discussed elements of the Illinois Department of Natural Resources' Site M Master Plan at a public meeting, January 31, 1996, in Virginia. He is a member of the Site M Watershed Planning Group.

**Samuel V. Panno** provided data and technical assistance on bacterial contamination in septic effluent to the DuPage County Health Department in Lombard that was used in a forum at a national meeting, "Environmental Health and Water Quality." Panno reviewed a report on "Watersheds of Monroe and St. Clair Counties" for the Metro East Watershed Planning Office in Collinsville and has been a technical reviewer of reports and publications of the

Monroe-Randolph Bi-County Health Department for the grant received from the Illinois Environmental Protection Agency.

**Richard J. Rice** gave testimony at the meeting of the Low-Level Radioactive Waste Task Group, June 19, 1996, in Springfield, on oil production and waterflood operations and their potential for groundwater contamination in Illinois.

**James B. Risatti** sent a solicited letter of advice to the Illinois Department of Natural Resources' (DNR) Planning Division concerning the siting of septic fields on water quality of the Volo Bog Natural Area. He conferred and performed field work with representatives of DNR's Divisions of Planning and Land and Education on the siting of septic fields at the Volo Bog Natural Area. Risatti conferred and communicated with representatives of DNR's Divisions of Heritage, Land and Education, and Natural Resource Review and Coordination regarding the monitoring of groundwater quality at Volo Bog Natural Area and establishing a water-quality baseline and monitoring program for other wetlands in McHenry and Lake counties. He was an advisor to the Illinois Department of Natural Resources' Volo Bog Natural Area office on water-quality management for the area.

**Timothy C. Young** made presentations to the Village Board of Homer and engineering consultants on February 28, 1996, and again to the board and consultants at a public meeting, March 18, 1996, in Homer, concerning the use of an electrical earth resistivity survey to help the town locate a supplemental groundwater supply. Articles about the meetings were published by the *News Gazette* as well as newspapers in Homer, Ogden and Fairmount.

## Participation on Local/State/National Government Advisory Committees

**Michael L. Barnhardt** is a member of the following advisory committees for the Department of Natural Resources: Site M Master Plan Advisory Committee, which met November 30, 1995, and February 26, 1996, in Springfield; and the Watershed Planning Committee, which met on January 19, 1996, and held a town meeting concerning Site M's watershed, January 31, 1996, in Virginia.

**Steven E. Benton** serves as a technical advisor on the Pratts Wayne Woods Advisory Committee of the DuPage County Forest Preserve, which met May 29, 1996, in Glen Ellyn.

**Richard C. Berg and Beverly L. Herzog** represent the ISGS on the Interagency Coordinating Committee on Groundwater (ICCG), which meets quarterly. **Wayne T. Frankie**



represents the ISGS on the Education Subcommittee of the ICCG.

**Richard A. Cahill** is an advisor to the Sediment Work Group on the Lake Michigan Mass Balance Program for the U.S. Environmental Protection Agency's Great Lakes National Program Office.

**Heinz H. Damberger** is a member of the Steering Committee of the U.S. Department of Energy's Energy Information Administration's Coal Reserve Assessment Program, for which he reviewed the progress and final reports on coal reserve base reassessment by the Kentucky Geological Survey. He is a reviewer of research proposals on coal for the National Science Foundation and Chair of the Advisory Committee of the Illinois Basin Coal Sample Program.

**Sally L. Denhart** is a member of the Department of Natural Resources' State Web Team, which meets monthly.

**Leon R. Follmer** is a member of the U.S. National Committee of the International Quaternary Association, established by the U.S. National Academy of Science through the National Research Council.

**Beverly L. Herzog**, as the ISGS' representative to the Water Resources Center's Executive Committee, has reviewed proposals on water-related research and participated in writing a plan for studying the Mahomet Valley Aquifer System. She is also a member of the Executive Committee of the Illinois Groundwater Consortium, helping to write the request for proposals and moderating a session at the annual meeting.

**Bryan G. Huff** is a member of the Potential Gas Committee for the Colorado School of Mines, Golden, CO., which publishes an annual summary report.

**Ivan G. Krapac** is a member of the advisory panel for the Illinois Attorney General's Office concerning the hog confinement facility being built by Land of Lakes in Cass County. He is also a member of the Department of Natural Resources' Interagency Committee formed to address regulations for the Livestock Management Facilities Act.

**David R. Larson** is a member of the Water Quality Focus Group, which provides an interagency forum for discussing water quality issues facing Illinois, and met July 18, 1995, in Springfield.

**Timothy H. Larson** is a member of the Science Assessment Committee of the Urbana Unified School District 116.

**Zakaria Lasemi** is a member of the Quick Identification Team, comprised of staff members from the Illinois Department of Transportation, the ISGS and the aggregate industry, to initiate and implement a project that will develop petrographic, geochemical, mineralogical, textural and petrophysical criteria for quick identification of the quality of limestone and dolomite mined for construction aggregate.

**Edward Mehnert** is a member of the Pesticide Subcommittee of the Interagency Coordinating Committee on Groundwater (ICCG).

**Michael V. Miller** is a member of the Interagency Wetlands Committee, advising the Department of Natural Resources (DNR) on the administration of the Interagency Wetlands Act; the Wetland Subcommittee of the Natural Resources Coordinating Committee, charged with advising DNR and the U.S. Environmental Protection Agency on mandated wetland conservation strategies; the Illinois Department of Transportation's District 1 Wetlands Committee; the DuPage County Forest Preserve District's Wetlands Committee; and the Embarras River Technical Action Team to advise the Embarras River Management Association on a watershed management plan.

**Daniel O. Nelson** serves as technical advisor to the Illinois Geographic Information System (GIS) Subcommittee for which he developed a list of the ISGS' GIS data sets for the Department of Natural Resources' (DNR) management, developed a format for metadata for the "1996 DNR GIS CD-ROM," and coordinated the Survey's efforts in the contribution of data and metadata for the CD-ROM.

**Michael A. Phillips** was a panel member, December 4, 1995, of the Educational Users Focus Group on the Cypress Creek National Wildlife Refuge.

**C. Brian Trask** is Chair of the Environmental Advisory Commission of the Champaign City Council.

**C. Pius Weibel** is a member of the Technical Advisory Committee of the Embarras River Management Association, which met October 26, 1995, in Newton.

# Contributions to the Public and Industry

## Popularized Addresses/Presentations for Civic Groups/Public Meetings

**Robert A. Bauer** spoke to members of the Central Illinois Chapter of the Red Cross, October 24, 1995, in Peoria, on "Earthquakes in the Midwest and Their Impacts." He made a presentation on earthquakes to the American Society of Safety Engineers, Central Illinois Chapter, November 15, 1995, in Bloomington, covering the documented and expected impacts of earthquakes in the Midwest affecting the safety of workers in Central Illinois. He also made two presentations on earthquakes in the Midwest to the staff of the Illinois Emergency Management Agency on January 23-24, 1996, in Springfield.

**Richard C. Berg** spoke on the "McHenry County Geologic Mapping Program" to members of the Interagency Coordinating Committee on Groundwater, October 16, 1995, in Champaign. He also talked about the "Woodstock Groundwater Protection Needs Assessment" at the Groundwater Guarding meeting and a Greenwood Township meeting on October 18, 1995. **Berg, Beverly L. Herzog, and Sam V. Panno** were interviewed for a full-page feature story on the Mahomet Valley Aquifer System, which ran in the *Sunday News Gazette* during November 1995.

**Ross D. Brower** hosted a groundwater display at the Environmental Open House, June 17, 1996, in Cerro Gordo, to which the public was invited from Piatt, Macon and DeWitt counties and surrounding areas.

**Michael J. Chrzastowski and Anthony M. Foyle** were interviewed for and quoted in the lead story related to sand depletion in the Features Section of the *News Gazette*, May 23, 1996, Champaign.

**Joan E. Crockett, Joseph A. Devera, and Janis D. Treworgy** developed a 20-minute program, featuring "Earthquakes and Volcanoes," for a Stewardship Program geared to elementary school children that was convened by the University of Illinois and the Department of Natural Resources, April 23-26, 1996, in Dixon Springs State Park. Crockett and Treworgy worked the ISGS' station, at which the program was presented, April 23 and 24, and Devera and **F. Brett Denny**, April 25 and 26.

**Ardith K. Hansel** presented a slide-show talk on Illinois' glacial heritage to the Loyal Order of Earth Science Society, November 20, 1995, in Springfield.

**Randall E. Hughes and Duane M. Moore** are among the co-authors of a popular poster, "New Illinois Pipestone revises Hopewell trade routes," which has been on display at the Kampsville Archaeological Center most of the year.

**Dennis R. Kolata** presented a slide show on and talked about "Fossils of northern Illinois," February 22, 1996, at Collectors Day at the Burpee Museum of Natural History in Rockford.

**Timothy H. Larson** gave a talk on earthquakes, July 19, 1995, at the Discovery Place in Champaign and again on April 16, 1996, at Armstrong Grade School, Urbana. He also spoke on science in Antarctica, January 19, 1996, to students at Leal Grade School, Urbana.

**Chao-Li Liu** was interviewed for a full-page feature story, "2000 B.C. was a very good year for water: Dating techniques allow geochemist to determine everything from the age of water to when an extinct plant was alive," in the *News Gazette*, October 19, 1995, in Champaign-Urbana.

**Donald G. Mikulic** spoke at the meeting of the Lincoln Orbit Earth Science Society, August 1995, in Springfield. He was the primary contact for a front-page article about the Chicago area aggregate industry in the March 15, 1996, edition of the *Chicago Tribune*.

**Samuel V. Panno** presented a talk entitled "Groundwater contamination in southwestern Illinois' sinkhole plain," January 18, 1996, to the Southern Illinois Groundwater Protection Committee in Collinsville.

**Michael A. Phillips** made the following presentations: "Geology," January 12, 1996, to seventh grade students at Vienna Grade School; "Geology and career preparation," January 12, 1996, at New Simpson Hill; "Earthquakes and Volcanoes," April 26, 1996, at Stewardship Day, Dixon Springs; and "Geology," May 10, 1996, to fifth grade students at Vienna Grade School.

**Matthew H. Riggs** gave a presentation on the different types of maps used and produced at the ISGS, May 9, 1996, to first grade students at Southside Elementary School in Champaign.

**James B. Risatti** presented a seminar, "Hydrology and chemistry of wetlands" at the Fourth biennial Wetland Seminar Series, April 29, 1996, at Volo Bog. He gave a seminar, the "Effects of Flooding on the Alluvial Aquifer at Mt. Pulaski," July 20, 1995, at the Central Illinois Water Operators Association's meeting and training session in observance of the 100th Anniversary of the Mt. Pulaski Municipal Water System in Mt. Pulaski.

**William R. Roy** made two presentations on "Geology," January 10 and May 16, 1996, at Yankee Ridge Elementary School in Urbana.

**Janis D. Treworgy** gave two one-hour workshops on groundwater at the annual Expanding Your Horizons in Science and Mathematics Day, February 24, 1996, at the University of Illinois-Springfield. She also gave three

presentations to students on general types of rocks in Illinois, February 29, 1996, at Ball Elementary School in Chatham and Butler Elementary School in Springfield.

**Robert C. Vaiden** made numerous presentations to school children and educators on "Geology," July 20, 1995, at Countryside Elementary School; July 26, 1995, at the Urbana Park District Nature Camp; and Prairie Elementary School. He has presented the "Build Illinois" demonstration in October 1995 to elementary students in Knox County; May 2, 1996, at an elementary environmental workshop in Knox County; May 4, 1996, to the Illinois Environmental Education Group at the Anita Purves Nature Center; May 17, 1996, to attendees of a meeting sponsored by the Northeastern Illinois Regional Groundwater Protection Committee at Joliet Junior College; and May 21, 1996, to middle school students from Gibson City. Vaiden described the McHenry County mapping

program, May 28, 1996, at the Environmental Health and Groundwater Expo, sponsored by the Northern Regional Groundwater Protection Planning Committee.

**Timothy C. Young** was interviewed by a Decatur radio station at the Illinois Specialty Growers Association's convention in Decatur about the ISGS' public services for groundwater supplies.

## Other Services to the Public

**John M. Masters** and **Phillip C. Reed** are judging co-chairs for the Earth Sciences Division of the Illinois Junior Academy of Sciences. **Anne L. Erdmann**, **Jonathan H. Goodwin**, **Randall E. Hughes**, **Myrna M. Killey**, **Christopher J. Stohr**, and **Timothy C. Young** and others served as judges for the State Science Exposition, May 4, 1996, in Champaign.

# Activity Measures

All Illinois state agencies are required to provide activity measures as part of their annual budget presentations to the General Assembly. The ISGS uses a wide range of activity measures to gauge our effectiveness in reaching the public with our information and services (see table below). The measures are also helpful for indicating where the members of the research and service staff are applying their greatest energies, and whether we may need to adjust or reshape our program, budget, or organization.

Some of our annual measures are calculated from samples for selected months; for example, the number of long-distance telephone calls made by the staff was projected from the number of calls billed to the ISGS during measures are based on summations of counts provided by each member of our staff. Despite some significant variations in the accuracy of these measures, we think that changes in the activity measures from year to year reflect real trends whose causes need to be analyzed and understood.

The Scientific and Administrative sections of the Survey were reorganized late in FY 96. However, to provide a more accurate comparison with past years, the activity measures for FY 96 were adjusted to fit the organizational framework that was in place for most of the fiscal year. The activity measures reported for FY 97 will reflect the new organizational structure.

## Research Activities

The ISGS's scientists and support staff reported 165 active state-funded research and service projects in progress during the fiscal year—51 fewer than the 216 reported last year. Of these, 70 were in the area of Energy and Mineral Resources (down 16), 19 in Geochemistry (down 7 from last year), 40 in Geologic Mapping and Framework Studies (up 1), 20 in Groundwater and Environmental

Geology (down 38) and 16 in Technical and Administrative Services (up 9).

The number of active State-supported projects reported by our scientists has fluctuated widely in recent years. Although the exact cause of these fluctuations is unknown, it may reflect differences from year to year in the staff member's perception of what constitutes a "project." A more formal project tracking system that will be instituted soon is expected to provide as accurate a count of the number of state-funded projects and activities in the future as we now have for our sponsored research projects.

Our grants and contracts office reported 95 sponsored research and service projects active in FY 96, an increase of 1 from FY 95. Of the 95 active projects, 37 were in the area of Energy and Mineral Resources (unchanged from last year), 6 in Geochemistry (down 2), 17 in Geologic Mapping and Framework Studies (up 3), 34 in Groundwater and Environmental Geology (unchanged), and 1 in Technical and Administrative Services (unchanged).

According to the count by our grants and contracts office, ISGS scientists submitted 64 proposals for external support of research investigations in FY 96, 7 more than last year. Of these, 33 were submitted by scientists in the Energy and Mineral Resources area, 9 in Geochemistry, 8 in Geologic Mapping and Framework Studies, and 14 in Groundwater and Environmental Geology. Many of the proposals we submit are prepared at the request of the sponsoring agency after preliminary negotiations are completed. Of the 64 proposals submitted in FY 96, 39 were accepted by the sponsor and at least partially funded, 15 were either rejected by the sponsor or withdrawn by the ISGS, and 10 were still pending at the close of the fiscal year. This represents a success ratio of about 61% for the proposals on which a decision had been reached by the sponsor during the fiscal year, up

**Selected activity measures, 1995-96.**

	Energy and Mineral Resources	Geochemistry	Geologic Mapping and Framework Studies	Groundwater and Environmental Geology	Technical and Administrative Services	Total FY 96	Total FY 95
Reports and maps published distributed	97	15	65	44	7	228	268
Active projects	70	19	40	20	16	165	216
Visitors and office conferences	450	59	297	361	2,386	3,553	3,368
Letters and unpublished reports	585	13	274	336	432	1,867	1,942

from the 53% success ratio reported last year. The improvement in our success ratio from last year's number indicates that the uncertainties that were present at the end of the last fiscal year as a result of our switch to the new department have been resolved, for the most part. The drop in our success ratio last year was, indeed, an anomaly.

To transfer the results of our scientific investigations and service activities to our user communities, ISGS scientists prepared numerous reports, maps and other documents for publication in our own series, in scientific and trade journals, or in proceedings volumes and guidebooks compiled for scientific meetings. The authors and titles of these formally published documents are listed in the *Publications* section of this volume of our annual report.

The number of publications prepared this year, as shown in the table of activity measures above, decreased by 15% from the number published last year. Of these publications, 164 appeared in external journals and 64 in our own series. Authors from the Energy and Mineral Resources research and service component of our program prepared 97 publications, 77 for external venues and 20 for our internal series; Geochemistry accounted for 15 publications, (12 external, 3 internal); Groundwater and Environmental Geology released 44 (25 external, 19 internal); Geologic Mapping and Framework Studies added 65 (50 external, 15 internal), and the Technical and Administrative Services component produced 7 publications for our internal series.

## Information Responses

To provide scientific information to those requesting it, the ISGS Library and Information Office sold 5,745 copies of our books and pamphlets and 5,655 copies of our maps and cross sections. We also distributed 6,806 free copies of our books and 1,295 free copies of ISGS map products. The total of 19,501 document copies distributed is 2% fewer than last year's total. The number of books and pamphlets distributed free fell by 14 percent compared with last year, but the number of map products distributed free rose by about 46 percent. The number of books and pamphlets sold fell 15 percent, but sales of maps and cross sections rose about 31 percent. We sold 16,432 copies of United States Geological Survey map products and distributed 3,030 free copies. The number of USGS maps sold this year is about 1 percent less than last year, and the number of free copies distributed is 24% less than last year. Based on statistics provided by the U.S. Geological Survey, this sales volume for USGS map products places the ISGS among the 50 largest dealers in the U.S.

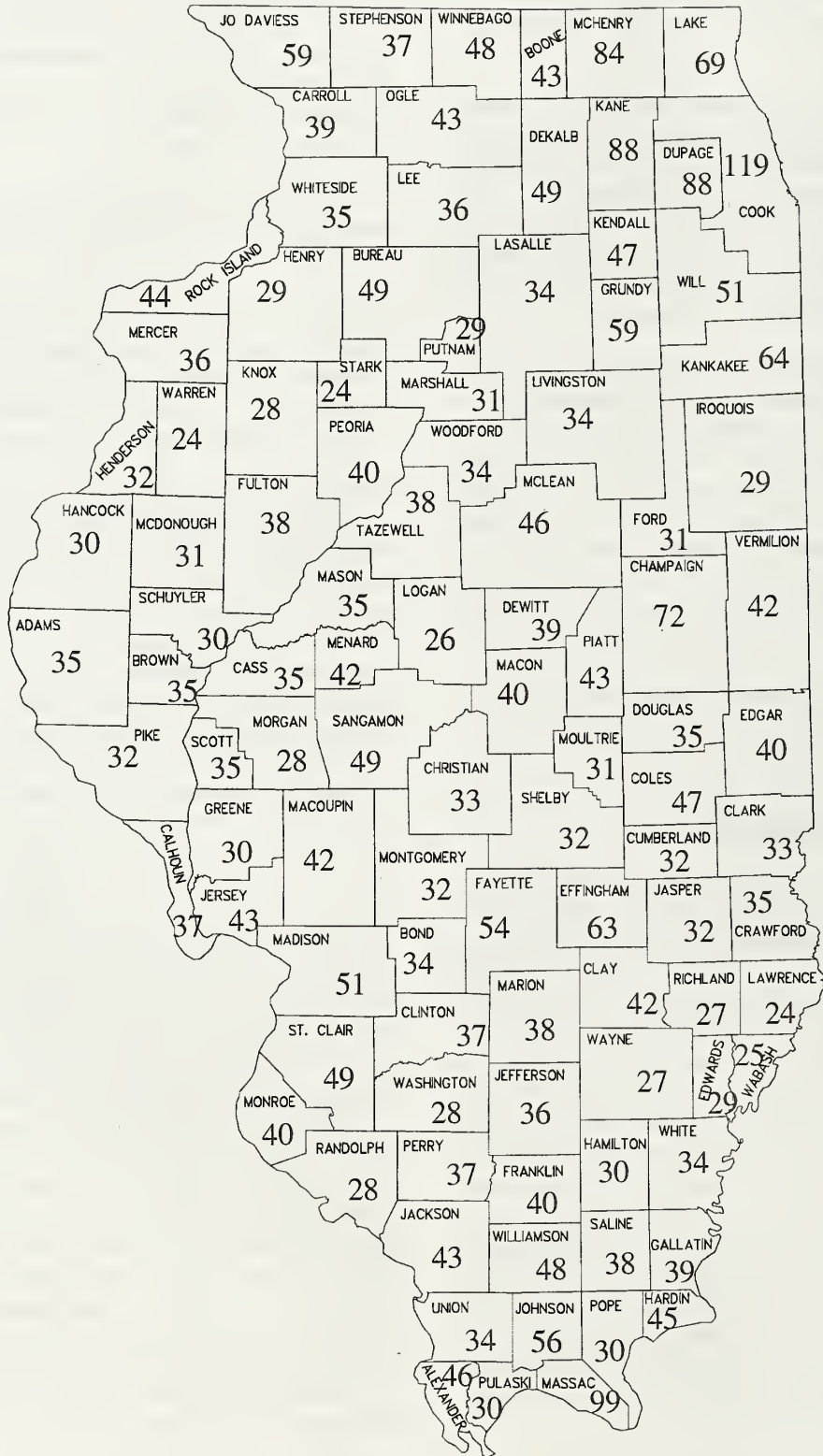
During the reporting period, 3,553 visitors came to the Geological Survey's offices and laboratories to seek scientific advice, discuss proposed activities, examine our voluminous files of scientific data and purchase copies of publications. The number is about 5 more than the number of visitors for FY 95, as shown in the activity measures table.

The total number of visitors who came to the Information Office was 1,472 in FY 96 compared to 1,619 last year. In FY 96, 772 visitors came to the Geological Records Library, down from 993 in FY 95; 53 public visitors came to the Geological Samples Library in FY 96 compared to 95 in FY 95. Visitors to the Samples Library, both staff members and the public, examined 285 sets of samples, 42% fewer than last year. This year 3,052 reference requests were made to the Library/Map room, an increase of 647 over last year.

To respond to inquiries and conduct Survey business, our scientists reported sending out 1,867 letters and unpublished reports, 75 fewer than last year. An estimated 30,025 long distance telephone calls were billed to the Survey for the year, about 2,855 fewer than last year. The Information Office received 9,191 incoming phone calls in FY 96, down almost 2% from last year's total. Many of these incoming calls are directed to our scientists to respond to requests for specific geologic information.

The decline in the number of visitors, letters and other slower types of communication continues the trend of the last few years. Computer e-mail messages and other methods for transmitting data directly through the Internet worldwide network are rapidly becoming the preferred means of transferring information to our clients. Statistics on use of the ISGS home page for the Worldwide Web reflect the growing importance of this new medium for technology transfer. This year, users selected a document on the ISGS home page 120,174 times, an average of 10,014 times per month. This number of "hits" per month is more than 4 times the rate observed during the first 6 months of our home page's operation last year. The ISGS server connected with a total of 28,303 different computers during this time period (an approximation of the number of individual people who contacted us), an average of 4,717 computers per month or approximately 157 per day. The number of computer contacts per month has increased almost 17-fold over last year's contact. Over the final six months of FY 1995, there were 14,000 readers of documents on the home page. Through all of FY 96, there were nearly 95,500 readers of documents, including 23,974 educational institutions, 33,081 commercial online services, 3,213 government agencies, 2,163 unclassified U.S., 1,250 organizations, and 464 U.S. Military. Inquiries from foreign countries totaled 15,651 and there were 15,681 Internet service providers used (other than .com). On our home page, you may click on the outline of a county to obtain a list of pertinent ISGS publications. The map shows the number of times a user requested this listing for a county. The service has been available for all 102 counties since June 1, 1995.

Demand for copies of well logs and other records distributed by our Geological Records Library (GRL) increased from last year. The GRL sold 4,829 continuous well log copies, 164 more than last year; distributed 198 free well log copies; sold 46,933 single-page copies of geological records (mostly water well logs); and distributed



3,523 for free (50,456 total). A total of 29,234 files were used in the Geological Records Library this year.

The Educational Extension Unit hosted 1,075 persons on the four geology field trips offered this year, of whom 400 were students and 115 were teachers. There were 35 visitors to the Education Extension Unit and 375 phone calls. This year 66 rock and mineral sets were distributed and there were 207 other responses for educational materials. The staff of the unit presented 7 teacher workshops.

Exhibits and displays about the ISGS and its programs were mounted this year at the Lincoln Orbit Earth Science Society's Gem Mineral and Fossil Show, the Illinois Science Teachers Association Annual Meeting; the University of Illinois Agriculture Open House, the Lions Club in Farmer City, and at the Career Day at Mahomet Jr. High School. Members of the ISGS staff had contact with the press on 36 occasions.

## Identifications and Analyses

To carry out their research and service projects during the reporting year, ISGS chemists completed at least 6,018 separate elemental determinations on 208 samples of rock, soil, brine and water. The chemists ran 13,925 analyses on 351 coal samples, 22,765 ICP determinations on 757 water samples, and 5,814 ICP determinations (coal related) on 193 aqueous extracts. The Isotope Geochemistry Laboratory performed 1,391 separate isotopic determinations (120 sulfur, 144 hydrogen, 107 nitrogen, and 1,020 carbon), completed 284 carbon-14 age determinations, ran determinations for tritium on 220 water samples, and ran gas chromatography analyses on 50 samples. The Coal Analysis Laboratory completed 2,610 proximate, ultimate, hydrogen, sulfur and carbon analyses on 522 samples of coal and coal-related materials. They also completed particle size determinations on 84 samples and made 54 determinations of fluorine and chlorine in 27 samples.

The Environmental Geology Laboratory completed immunoassay determinations for pesticides in 269 samples. Tritium was determined by scintillation counter in 457 samples. Ion chromatography was used to determine nitrate in 371 samples. The Environmental Geology Laboratory also monitored 38 double-ring infiltrometers and 72 tensiometers (60 at the liner and 12 in the parking lot).

Our scientists also completed 2,333 mineralogical determinations by x-ray diffraction, described 26 petrographic thin sections, made coal petrographic analyses (kerogen analysis under blue light) on 5 samples and processed 45 samples of coal through the low-temperature ashing systems. The scanning electron microscope with energy-dispersive X-ray fluorescence detector was used to make 326 determinations on 51 samples. At the Applied Research Laboratory, we performed 222 thermogravimetric analyses, 27 temperature-programmed desorption tests, 63 determinations of surface area, 23 fluidized bed tests and 15 tube furnace tests.

In the field and laboratory, our scientists measured 92 stratigraphic sections, described 210 cores studied 106 sample sets. Hand specimen identifications for others totaled 283. The Palynology Laboratory completed 10 biostratigraphic determinations on 16 samples. Geotechnical analyses included 9 hydrometer tests, 35 sieve tests, 55 determinations of total suspended sediment content, 6 specific gravity tests, 1,194 gas chromatograph analyses, and a total of 57 immunoassay determinations (26 for petroleum products, 7 for pesticides, and 24 for PCBs).

The reservoir engineering laboratory completed measurements of porosity and permeability on 180 core plugs, 150 minipermeameter measurements, 80 coreflow tests, 1 oil viscosity (imbibition) test, 25 resistivity measurements, 1 isochronal gas flow measurement, 1 PVT analysis, and collected 11 gas samples for chromatographic analysis.

To explore for groundwater, and for other purposes, our scientists ran 106 borehole geophysical logs (50 gamma, 18 caliper, 19 neutron, 18 density, and 1 temp/res). They also conducted 35 electrical earth resistivity surveys (9 farm, 5 municipal, 18 domestic and 3 subdivision). In Randolph County 1 seismic survey was conducted.

The staff of the Digital Cartography and Spatial Analysis Section and other staff members throughout the ISGS wrote 375 custom computer programs in various languages, completed 57 data-entry projects of various sizes, digitized 107 maps, plotted 1,297 copies of various digital map files for internal use or external distribution (includes draft maps, maps for QA review, maps for publication review, project maps, special order maps, published maps, and Questor maps), and sold 54 electronic data sets.







