

Publications/Presentations
Fiscal Years 1999-2005
Environmental Research Division

K. Haugen, Editor

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Sisterson, D.L., "ARM Program," Global Change Education Program Orientation, Tulane University, New Orleans, Louisiana, June 13, 2000.

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Sturchio, N.C., “Isotopic Insights to Chlorinated Solvents in Groundwater,” Department of Earth and Environmental Sciences, University of Illinois, Chicago, Illinois, December 2, 1999.

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None.

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7. Patents Issued

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**Publications/Presentations
Fiscal Year 2002**

Environmental Research Division

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Jastrow, J.D., "Aggregate Protection and the Storage of Carbon in Grassland Soils: Dynamics and Mechanisms," 11th Annual Kling Anderson Range Science Lecture, Department of Agronomy, Kansas State University, Manhattan, Kansas, April 24, 2002.

Jastrow, J.D., "Prairie Restoration below Ground: Rebuilding Soil Structure and Organic Matter," Morton Arboretum Winter Research Seminar Series, "Look out Below!" Lisle, Illinois, February 21, 2002.

Jastrow, J.D., "Prairie Restoration below Ground: Rebuilding Soil Structure and Organic Matter," Department of Geography Colloquium Series, Northern Illinois University, DeKalb, Illinois, February 22, 2002.

Jastrow, J.D., Moran, K., Remmes, K., Ullian, J., Maxeiner, E., and Miller, R.M., "Dynamics of Organic Matter Storage in Cropped Soils Returned to Perennial Grassland," DOE Terrestrial Ecosystem and Carbon Cycle Science Team Meeting, Argonne National Laboratory, Argonne, Illinois, October 30, 2001.

Kelly, S.D., "Basics of Data Processing," EXAFS Data Collection and Analysis Workshop, National Synchrotron Light Source, Brookhaven National Laboratory, Upton, New York, September 23-25, 2002.

Kelly, S.D., Kemner, K.M., Fein, J.B., Fowle, D.A., Boyanov, M.I., Bunker, B.A., and Yee, N., "XAFS Study of Bacterial Cell Wall Functional Groups Responsible for U Adsorption," Synchrotron Environmental Science-II, Argonne National Laboratory, Argonne, Illinois, May 6-8, 2002.

Kelly, S.D., Kemner, K.M., Fryxell, G.E., Liu, J., Mattigod, S.V., and Ferris, K.F., "Determination of the Binding Geometry of Oxometalate Anions to Self-Assembled Monolayers on Mesoporous Supports," Synchrotron Environmental Science-II, Argonne National Laboratory, Argonne, Illinois, May 6-8, 2002.

Kelly, S.D., Kemner, K.M., Fryxell, G.E., Liu, J., Mattigod, S.V., and Ferris, K.F., "XAFS Determination of the Binding Mechanism of Contaminant Anions to Self-Assembled Monolayers on Mesoporous Supports," 11th Users Meeting for the APS, Argonne National Laboratory, Argonne, Illinois, October 9-11, 2001.

Kelly, S.D., Kemner, K.M., O'Loughlin, E., Fein, J.B., Fowle, D.A., Boyanov, M.I., Bunker, B.A., Yee, N., and Coates, J.D., "XAFS Investigations of Interactions of U(VI) with Minerals and Microbes," 11th Users Meeting for the APS, Argonne National Laboratory, Argonne, Illinois, October 9-11, 2001.

Kemner, K.M., “High-Energy X-ray Microprobe Investigations of Metal-Mineral-Microbe Interactions,” Synchrotron Environmental Science-II, Argonne National Laboratory, Argonne, Illinois, May 7, 2002.

Kemner, K.M., “Synchrotron Radiation in the Environmental Sciences and Geosciences,” 224th American Chemical Society National Meeting, Boston, Massachusetts, August 21, 2002.

Kemner, K.M., “X-ray Microprobe Investigations of Bacteria in Planktonic and Surface-Adhered States for Environmental Research,” 28th Annual SSRL Users’ Meeting, Stanford Synchrotron Radiation Laboratory, Menlo Park, California, October 18-19, 2001.

Kemner, K.M., Kelly, S.D., O’Loughlin, E.J., Cai, Z., Cook, R., Csencsits, R., Lai, B., Maser, J., Suzuki, Y., and Banfield, J.F., “Investigations of Nanoparticles Formed via Biogeochemical Interactions,” National Synchrotron Light Source Annual Users’ Meeting, Brookhaven National Laboratory, Upton, New York, May 2002.

Kemner, K.M., Kelly, S.D., O’Loughlin, E.J., Cai, Z., Cook, R., Csencsits, R., Lai, B., Maser, J., Suzuki, Y., and Banfield, J., “High Energy X-ray Investigations of Biotransformations and Biogeochemical Dynamics at the Advanced Photon Source,” Annual NABIR Programmatic Meeting, Warrenton, Virginia, March 2002.

Kemner, K.M., Kelly, S.D., O’Loughlin, E.J., Donnelly, M., Khare, T., Tollaksen, S., Giometti, C., Cai, Z., Cook, R., Csencsits, R., Lai, B., Maser, J., Suzuki, Y., and Banfield, J., “A Summary of Some of the Synchrotron-Based Environmental Science Studies Being Performed by the Molecular Environmental Science Group,” Biosciences Lunchtime Seminar Series, Argonne National Laboratory, Argonne, Illinois, May 2002.

Kemner, K.M., Kelly, S.D., O’Loughlin, E.J., Suzuki, Y., Banfield, J., and Coates, J., “X-ray Absorption Spectroscopy Studies of U(VI) Interactions with Minerals and Microbes,” American Chemical Society Meeting, Orlando, Florida, April 2002.

Kemner, K.M., Kelly, S.D., O’Loughlin, E.J., Suzuki, Y., Banfield, J., Boyanov, M., Fein, J., and Bunker, B.A., “XAFS Investigation of Heavy Metal and Radionuclide Biogeochemical Dynamics with the MR-CAT Insertion Device,” Program Evaluation Board Meeting of the Advanced Photon Source, Argonne National Laboratory, Argonne, Illinois, February 28, 2002.

Kemner, K.M., Kelly, S.D., O’Loughlin, Suzuki, Y., Banfield, J., Csencsits, R., and Cook, R., “Investigations of Biogeochemical Formation of Uranium Nanoparticles,” Annual NABIR Programmatic Meeting, Warrenton, Virginia, March 2002.

Kim, J., and Sultan, M., “Modeling the Hydrogeologic Impacts of the Tushka Canal Project on the Nubian Aquifer (SW Egypt) and on the Saltwater Intrusion in the Nile Delta,” Geological Society of America Annual Meeting, Boston, Massachusetts, November 1-10, 2001.

Kotamarthi, V.R., and Kleinman, L., “Report from Modeling Focus Group: Emissions Inventions Needs,” Annual Atmospheric Science Program Meeting, U.S. Department of Energy, Albuquerque, New Mexico, March 20, 2002.

Kotamarthi, V.R., and Wesely, M.L., "Effects of Fast Chemical Reactions on Estimated Emission Fluxes of NO_x from Soil," Fourth Atmospheric Chemistry Conference: Urban, Regional, and Global-Scale Impacts of Air Pollutants, 82nd Annual Meeting of the American Meteorological Society, Orlando, Florida, January 15, 2002.

Kotamarthi, V.R., Doskey, P.V., Xu, Y., Wesely, M.L., Lonneman, W., and Olszyna, K., "Diurnal Variation of NMHC at a Downtown Site in Nashville: Model and Measurements," Fourth Atmospheric Chemistry Conference: Urban, Regional, and Global-Scale Impacts of Air Pollutants, 82nd Annual Meeting of the American Meteorological Society, Orlando, Florida, January 15, 2002.

LaFreniere, L.M., "Application of Cone Penetrometer Technology to Environmental Site Characterization," Course on Cone Penetration Testing (CPT) in Geotechnical and Environmental Practice, Argonne National Laboratory, Argonne, Illinois, April 18-19, 2002.

Lesht, B.M., "Describing the Atmospheric State: Converting Radiosonde Measurements to Data," Radiosonde Workshop, National Aeronautics and Space Administration, Hampton, Virginia, May 23, 2002.

Lesht, B.M., "Dual-Radiosonde Experiments during the Fall 2000 WVIOP," Water Vapor Intensive Operations Period 2000/ARM-FIRE Water Vapor Experiment Workshop, Atmospheric Radiation Measurement Program, U.S. Department of Energy, Madison, Wisconsin, November 28, 2001.

Lesht, B.M., "Two New Centers Linking Argonne and University of Chicago Research in Environmental Sciences," Argonne Partnership Committee Meeting, Argonne National Laboratory, Argonne, Illinois, December 10, 2001.

Lesht, B.M., and Richardson, S.J., "The Vaisala Radiosonde Dry-Bias Correction Redux," Atmospheric Radiation Measurement Program Science Team Meeting, U.S. Department of Energy, St. Petersburg, Florida, April 10, 2002.

Lesht, B.M., Hawley, N., and Schwab, D.J., "Cross-Shore Variations in Wave Forcing and Bottom Sediment Response in Southeastern Lake Michigan," Ocean Sciences Meeting, American Geophysical Union, Honolulu, Hawaii, February 11, 2002.

Lesht, B.M., Stein, M., Amit, Y., Kotamarthi, R., Schwab, D., and Beletsky, D., "Integrating Numerical Models and Statistical Methods," Center for Integrating Statistical and Environmental Sciences Colloquium, University of Chicago, Chicago, Illinois, March 14, 2002.

Lesht, B.M., Stroud, J.R., Eadie, B.J., and Leshkevich, G.A., "A Three-Year Time Series of Chlorophyll-a and Primary Production in Southern Lake Michigan Obtained from Satellite Observations," 45th Conference of the International Association for Great Lakes Research, Winnipeg, Manitoba, Canada, June 4, 2002.

Liljgren, J.C., "A Site-Independent Liquid Water Path Retrieval," Atmospheric Radiation Measurement Program Cloud Properties Working Group Meeting, U.S. Department of Energy, Boulder, Colorado, January 24, 2002.

Liljegren, J.C., “Continued Evaluation of the Microwave Radiometer Profiler,” Atmospheric Radiation Measurement Program Science Team Meeting, U.S. Department of Energy, St. Petersburg, Florida, April 9, 2002.

Liljegren, J.C., “Toward One CART: SGP Accomplishments and Goals,” Atmospheric Radiation Measurement Program, Cloud and Radiation Testbed, Operations Strategic Planning Meeting, U.S. Department of Energy, Albuquerque, New Mexico, November 13, 2001.

Liljegren, J.C., Sisterson, D.L., and Teske, J.J., “Status, Accomplishments, and Recent Developments at the Southern Great Plains (SGP) Cloud and Radiation Testbed (CART),” Atmospheric Radiation Measurement Program Science Team Meeting, U.S. Department of Energy, St. Petersburg, Florida, April 9, 2002.

Marley, N.A., “The Florida Everglades, Problem and Proposed Solution: Will It Work?” Global Change Education Program Orientation, University of Florida, Gainesville, Florida, June 15, 2002.

Marley, N.A., and Gaffney, J.S., “Measurements of NO₂, PANs, and Ozone at Deer Park, Texas,” An Earth Odyssey: Nobel Symposium on Atmospheric Chemistry, Santa Barbara, California, October 28-31, 2001.

Marley, N.A., and Gaffney, J.S., “Northeast Oxidant and Particulate Study (NEOPS): Preliminary Results from the Centerton, New Jersey, Field Site,” Fourth Atmospheric Chemistry Symposium: Urban, Regional, and Global Scale Impacts of Air Pollutants, 82nd Annual Meeting of the American Meteorological Society, Orlando, Florida, January 15, 2002.

Marley, N.A., and Gaffney, J.S., “Overview of ACP/EMP,” Global Change Education Program Orientation, University of Florida, Gainesville, Florida, June 15, 2002.

Marley, N.A., Gaffney, J.S., Cunningham, M.M., Martello, D.V., and Anderson, N.J., “Using Natural ⁷Be to Evaluate Upper-Air Transport of Aerosols and Gases in the Troposphere,” NETL PM2.5 Conference, Pittsburgh, Pennsylvania, April 9-10, 2002.

Matamala, R., “Carbon Cycling and Sequestration Belowground,” Global Change Education Program End of Summer Workshop, Argonne National Laboratory, Argonne, Illinois, August 19, 2002.

Matamala, R., “Carbon Storage in Terrestrial Ecosystems,” Morton Arboretum Winter Research Seminar Series, Lisle, Illinois, February 14, 2002.

Matamala, R., Jastrow, J.D., Amthor, J.S., Garten, C.D., and Miller, R.M., “Increasing Soil Carbon and Nitrogen Stocks under Restored Tallgrass Prairie: Influence of Soil Type,” 87th Annual Meeting of the Ecological Society of America, Tucson, Arizona, August 6, 2002.

Matamala, R., Smith, E., Jastrow, J.D., Miller, R.M., and Gonzalez-Meler, M.A., "The Use of Stable Isotopes to Study Carbon Cycling in a Restored Tallgrass Prairie Chronosequence," DOE Terrestrial Ecosystem and Carbon Cycle Science Team Meeting, Argonne National Laboratory, Argonne, Illinois, October 30, 2001.

Matamala, R., Smith, E., Jastrow, J.D., Miller, R.M., and Gonzalez-Meler, M.A., "The Use of Stable Isotopes to Study Carbon Cycling in a Restored Tallgrass Prairie Chronosequence," A History of Atmospheric CO₂ and Its Effects on Plants, Animals, and Ecosystems, Snowbird, Utah, December 6-8, 2001.

Miller, M.A., Miller, N.L., Sale, M.J., Springer, E.P., Wesely, M.L., Bashford, K.E., Conrad, M.S., Costigan, K.R., Kembell-Cook, S., King, A.W., Klazura, G.E., Lesht, B.M., Machavaram, M., Sultan, M., Song, J., and Washington-Allen, R., "Modeling and Analysis of the Water Cycle: Seasonal and Event Variability at the Walnut River Watershed," Hydrology Session H30: A Strategy for the Advancement of Hydrologic Science, American Geophysical Union 2001 Fall Meeting, San Francisco, California, December 12, 2001.

Miller, N.L., Miller, M.A., Springer, E.P., Wesely, M.L., King, A.W., Bashford, K.E., Conrad, M.S., Costigan, K.R., Depaolo, D.J., Fung, I., Kembell-Cook, S., Klazura, G.E., Lesht, B.M., Troyan, D.T., Machavaram, M., Sultan, M., Song, J., and Washington-Allen, R., "Modeling and Analysis of the Water Cycle Seasonal and Event Variability at the Walnut River Watershed," Fourth Atmospheric Chemistry Conference: Urban, Regional, and Global-Scale Impacts of Air Pollutants, 82nd Annual Meeting of the American Meteorological Society, Orlando, Florida, January 15, 2002.

Miller, R.M., "Biodiversity and Mycorrhizal Fungi in Chicago Wilderness," Seminar, Morton Arboretum, Lisle, Illinois, December 10, 2001.

Miller, R.M., "Can Mycorrhizal Fungi Create Their Own Currency?" Ecology Group Seminar, University of Illinois at Chicago, Chicago, Illinois, February 18, 2002.

Miller, R.M., "Can Mycorrhizal Fungi Create Their Own Currency?" Biochemistry/Microbiology Group Seminar, University of Montana, Missoula, Montana, April 8, 2002.

Miller, R.M., Wright, S.F., and Jastrow, J.D., "The Turnover and Input of Carbon by Arbuscular Mycorrhizal Fungi in Cropped Soils Returned to Perennial Grassland," DOE Terrestrial Ecosystem and Carbon Cycle Science Team Meeting, Argonne National Laboratory, Argonne, Illinois, October 30, 2001.

Nagy, K.L., Schlegel, M.L., Fenter, P., Cheng, L., and Sturchio, N.C., "The Nature of Cation Sorption on Mica Using X-ray Reflectivity," Synchrotron Environmental Science-II, Argonne National Laboratory, Argonne, Illinois, May 6-8, 2002.

Nagy, K.L., Schlegel, M.L., Fenter, P., Sturchio, N.C., and Cheng, L., "From the Still to Soils and Swamps: The (001) Surface of Muscovite in Salt and Natural Organic Matter Solutions," 11th Users Meeting for the APS, Argonne National Laboratory, Argonne, Illinois, October 10, 2001.

O'Loughlin, E.J., Kelly, S.D., and Kemner, K.M., "Mercury Reduction by Mixed Fe(II)/Fe(III) Hydroxide (Green Rust)," 22nd Annual North American Meeting of the Society of Environmental Toxicology and Chemistry, Baltimore, Maryland, November 15, 2001.

O'Loughlin, E.J., Kelly, S.D., Kemner, K.M., and Burris, D., "Organic and Inorganic Contaminant Reduction by Fe(II)/Fe(III) Hydroxy Sulfate (Green Rust)," U.S. Geological Survey, Menlo Park, California, December 6, 2001.

O'Loughlin, E.J., Kelly, S.D., Kemner, K.M., and Burris, D., "Reduction of Organic and Inorganic Contaminants by Green Rust," Seminar, Department of Natural Resources and Environmental Science, University of Illinois at Urbana-Champaign, Urbana, Illinois, February 11, 2002.

O'Loughlin, E.J., Kelly, S.D., Kemner, K.M., and Burris, D., "XAFS Study of the Catalytic Effects of Ag, Au, and Cu on the Reductive Dechlorination of Carbon Tetrachloride by Green Rust," Synchrotron Environmental Science-II, Argonne National Laboratory, Argonne, Illinois, May 6-8, 2002.

O'Loughlin, E.J., Kelly, S.D., Kemner, K.M., and Burris, D., "XAFS Study of the Catalytic Effects of Ag, Au, and Cu on the Reductive Dechlorination of Carbon Tetrachloride," 11th Users Meeting for the APS, Argonne National Laboratory, Argonne, Illinois, October 9-11, 2001.

O'Loughlin, E.J., Kelly, S.D., Kemner, K.M., Csencsits, R., and Cook, R.E., "Reduction of U(VI) by Mixed Fe(II)/Fe(III) Hydroxysulfate: Formation of UO_2 Nanoparticles," Gordon Research Conference on Environmental Sciences: Water, Plymouth, New Hampshire, June 23-28, 2002.

O'Loughlin, E.J., Ma, H., and Burris, D., "Catalytic Effects of Ni-Humic Complexes on the Reductive Dehalogenation of Chlorinated Alkanes and Alkenes," International Humic Substances Society 20th Anniversary Conference, Boston, Massachusetts, July 21-26, 2002.

Pekour, M.S., "Migrating Birds: Assessment of Impact on 915-MHz Radar Wind Profiler Performance at the Atmospheric Radiation Measurement Program's Southern Great Plains," 11th International Symposium on Acoustic Remote Sensing of the Atmosphere and Oceans, Institute of Sciences of the Atmosphere and Climate of the National Research Council of Italy, Rome, Italy, June 27, 2002.

Pekour, M.S., and Coulter, R.L., "Once More about Dot Echoes," 11th International Symposium on Acoustic Remote Sensing of the Atmosphere and Oceans, Institute of Sciences of the Atmosphere and Climate of the National Research Council of Italy, Rome, Italy, June 27, 2002.

Pekour, M.S., Wesely, M.L., Martin, T.J., and Cook, D.R., "A Study of Block Averaging versus Recursive Filters for Computing Scalar Eddy Covariances near the Surface," 25th Conference on Agricultural and Forest Meteorology, American Meteorological Society, Norfolk, Virginia, May 24, 2002.

Philbrick, C.R., Ryan, W.F., Clark, R.D., Doddridge, B.G., Dickerson, R.R., Koutrakis, P., Allen, G., Munger, J.W., McDow, S.R., Rao, S.T., Hopke, P.K., Eatough, D.J., Dasgupta, P.K., Tollerud, D.J., Georgopoulos, P., Klein, L.I., Daum, P., Nunnermacker, L., Dennis, R., Schere, K., McClenny, W., Gaffney, J., Marley, N., Coulter, R., Fast, J., Doran, C., and Mueller, P.K., "Overview of the NARSTO-NE-OPS Program," Fourth Atmospheric Chemistry Conference: Urban, Regional, and Global-Scale Impacts of Air Pollutants, 82nd Annual Meeting of the American Meteorological Society, Orlando, Florida, January 15, 2002.

Richardson, S.J., Lesht, B.M., Bahrmann, C.P., and Tobin, D., "Radiosonde Scaling Using a Chilled-Mirror Hygrometer," Atmospheric Radiation Measurement Program Science Team Meeting, U.S. Department of Energy, St. Petersburg, Florida, April 10, 2002.

Rodriguez, V., Gaffney, J.S., and Marley, N.A., "Black Carbon Measurements Made with an Aethalometer in Chicago, Illinois," Undergraduate Environmental Chemistry Poster Symposium, American Chemical Society National Meeting, Orlando, Florida, April 8, 2002.

Schlegel, J.L., Nagy, K.L., Fenter, P., and Sturchio, N.C., "Atomic-Scale Structure of (101) and (100) Alpha-Quartz-Water Interfaces by High Resolution X-ray Reflectivity," 11th Users Meeting for the APS, Argonne National Laboratory, Argonne, Illinois, October 10, 2001.

Sisterson, D.L., "ARM Infrastructure Budget Planning for Out Years," Atmospheric Radiation Measurement Program, Infrastructure Management Board Meeting, U.S. Department of Energy, Herndon, Virginia, November 29, 2001.

Sisterson, D.L., "ARM Operations Annual Report to the Science Team Executive Committee (STEC)," Atmospheric Radiation Measurement (ARM) Science Team Executive Committee Meeting, U.S. Department of Energy, Herndon, Virginia, September 11, 2002.

Sisterson, D.L., "Critical Thinking," Pre-Service Teachers' Program, Argonne National Laboratory, Argonne, Illinois, June 17, 2002.

Sisterson, D.L., "Everyday Problem-Solving Skills in Science," DuPage County Science Conference, Regional Office of Education, Bensenville, Illinois, March 1, 2002.

Sisterson, D.L., "How Do Scientists Find the Right Answers?" Global Science and Technology Week Live Webcast, Meet a Scientist or Engineer, National Science Foundation, Argonne National Laboratory, April 29, 2002.

Sisterson, D.L., "How Do Scientists Get the Right Answer?" Lockport Rotary Club, Lockport, Illinois, May 9, 2002.

Sisterson, D.L., "How Scientists Find Answers," Pre-Service Teachers' Program, Argonne National Laboratory, Argonne, Illinois, June 12, 2002.

Sisterson, D.L., "Lake Breezes and Ultra-Light Flying," Clow Airport Flying Club, Naperville, Illinois, February 7, 2002.

Sisterson, D.L., "Meteorology as a Career," We Care Role Model Program, Chicago Police Department and Public Schools, Chicago, Illinois, May 8, 2002.

Sisterson, D.L., "Overview of ARM Operations Roles and Responsibilities," Atmospheric Radiation Measurement Program, Cloud and Radiation Testbed, Operations Strategic Planning Meeting, U.S. Department of Energy, Albuquerque, New Mexico, November 13, 2001.

Sisterson, D.L., "Research Meteorology," We Care Program, Chicago Public Schools and Police Department, Chicago, Illinois, March 20, 2002.

Sisterson, D.L., "Science in Search of the Right Answers," Professional Development Alliance, Regional Office of Education, Will, Grundy, and Kendall Counties, Joliet, Illinois, April 29, 2002.

Sisterson, D.L., "Severe Storms: The Science of Weather," Reed Middle School, Lockport, Illinois, February 13, 2002.

Sisterson, D.L., "Tornado Chamber Demonstrations," Churchville Middle School, Elmhurst, Illinois, March 5-6, 2002.

Sisterson, D.L., "Tornado Chamber Demonstrations," Jeerling Middle School, Orland Park, Illinois, March 22, 2002.

Sisterson, D.L., "Whipping Climate Change, Global Energy Crisis: Implications for the Future," Wisconsin High School Environment Conference, Milwaukee, Wisconsin, November 6, 2001.

Sisterson, D.L., "Whole Sky Imager Data Processing Progress," Atmospheric Radiation Measurement Program, Science Team Executive Committee Meeting, U.S. Department of Energy, Herndon, Virginia, November 30, 2001.

Smith, E., Matamala, R., Jastrow, J.D., Miller, R.M., and Gonzalez-Meler, M. "Evidence of Different C3 and C4 Carbon Turnover Rates in Soils from a Tallgrass Prairie Chronosequence," 87th Annual Meeting of the Ecological Society of America and 14th Annual International Conference of the Society for Ecological Restoration, Tucson, Arizona, August 6, 2002.

Soden, B.J., Turner, D.D., and Lesht, B.M., "Correction of Sonde Upper Tropospheric Humidity through Radiance Assimilation," Atmospheric Radiation Measurement Program Science Team Meeting, U.S. Department of Energy, St. Petersburg, Florida, April 10, 2002.

Song, J., and Wesely, M.L., "Estimating Long-Term Surface Hydrological Components by Coupling Remote Sensing Observation with Surface Flux Model," Geoinformatics 2002 (on CD), The International Association of Chinese Professionals in GIScience and Nanjing University, Nanjing, P.R. China, June 1, 2002.

Song, J., and Wesely, M.L., "Modeling Air-Surface Exchange with Remote Sensing," 2001 Meeting of the West Lakes Division, Association of American Geographers, Joliet, Illinois, October 12, 2001.

St. Martin, E., Millard, C.S., Frank, J., and Donnelly, M.I., "Production of Lactic Acid from Lignocellulosic Hydrolysates by *Escherichia coli* Mutants," 24th Symposium on Biotechnology for Fuels and Chemicals, Gatlinburg, Tennessee, April 29, 2002.

Sturchio, N.C., Fenter, P., Cheng, L., Park, C., Zhang, Z., Nagy, K.L., and Schlegel, M.L., "Nanoscale Structure at Mineral-Fluid Interfaces," American Geophysical Union National Meeting, San Francisco, California, December 12, 2001.

Sultan, M., "Applications of Remote Sensing in Interdisciplinary Research: Environment, Hydrology, and Tectonics," Seminar, Department of Geology, State University of New York, Buffalo, New York, February 26, 2002.

Sultan, M., "Assessment, Monitoring, and Modeling of LCLUC and Their Impacts on Groundwater Resources, Ecosystems, and Carbon Cycling in Saharan Africa: A Case Study, SW Egypt," LCLUC ST Tropical and Subtropical Workshop, National Aeronautics and Space Administration, College Park, Maryland, November 19-21, 2001.

Waples, J.T., Van Klump, J., Orlandini, K.A., Lesht, B.M., Eadie, B.J., Weckerly, K.M., and Szmania, D., "The Dynamics of Th-234/U-238 Disequilibria in Nearshore Lake Michigan as Determined by Daily Measurements," Ocean Sciences Meeting, American Geophysical Union, Honolulu, Hawaii, February 12, 2002.

Wesely, M.L., "Atmospheric Studies at the Walnut River Watershed in Kansas," Monthly Meeting of the Chicago Chapter of the American Meteorological Society, Romeoville, Illinois, December 4, 2001.

Wesely, M.L., "Dry Air-Surface Exchange of Trace Chemicals," Colloquium, Department of Atmospheric and Oceanic Sciences, University of Wisconsin, Madison, Wisconsin, March 26, 2002.

Wesely, M.L., "Quantifying Water Vapor and Carbon Dioxide Cycles," Reception and Poster Session, Office of Science Meeting with University Vice Presidents/Provosts, U.S. Department of Energy, Argonne National Laboratory, Argonne, Illinois, August 8, 2002.

Wesely, M.L., "Status of Observations at the Walnut River Watershed," AmeriFlux Meeting, U.S. Department of Energy, Argonne National Laboratory, Argonne, Illinois, November 1, 2001.

Wesely, M.L., and Kotamarthi, V.R., "Vertical Mass Flux Variations Associated with Rapid Chemical Reactions above Vegetation," 2002 Spring Meeting of the American Geophysical Union, Session on the Exchange of Chemically Reactive Trace Constituents between Biosphere and Atmosphere, Washington, D.C., May 31, 2002.

Wesely, M.L., and Schwartz, S.E., "ASP Participation in ARM Aerosol IOP," Annual Atmospheric Science Program Meeting, U.S. Department of Energy, Albuquerque, New Mexico, March 21, 2002.

Wesely, M.L., Doskey, P.V., and Touma, J.S., "Parameterizations of Dry Deposition for the Industrial Source Complex Model," 2002 Spring Meeting of the American Geophysical Union, Session on Wet and Dry Atmospheric Deposition: Scientific Advances and Policy Developments, Washington, D.C., May 31, 2002.

White, A.B., White, D.E., Angevine, W.M., Knupp, K., Coulter, R., Martin, T., Hubbe, J., and White, D., "The TEXAQS 2000 Edited Wind Profiler Dataset," Fourth Atmospheric Chemistry Conference: Urban, Regional, and Global-Scale Impacts of Air Pollutants, 82nd Annual Meeting of the American Meteorological Society, Orlando, Florida, January 16, 2002.

Xu, Y., "Modeling and Surface Fluxes with MM5," University Space Research Association, Huntsville, Alabama, February 25, 2002.

Xu, Y., and Wesely, M.L., "Effects of Biogenic Isoprene Emissions on Ozone Formation in the Eastern United States," Annual Atmospheric Science Program Meeting, U.S. Department of Energy, Albuquerque, New Mexico, March 20, 2002.

Xu, Y., and Wesely, M.L., "Simulation of Fine-Scale Soil Moisture Variations in the Walnut River Watershed in Kansas," Fourth Atmospheric Chemistry Conference: Urban, Regional, and Global-Scale Impacts of Air Pollutants, 82nd Annual Meeting of the American Meteorological Society, Orlando, Florida, January 14, 2002.

Xu, Y., Wesely, M.L., and Pierce, T.E., "A Study of Isoprene Emissions in Relation to Ozone Formation in the Eastern United States," Fourth Atmospheric Chemistry Conference: Urban, Regional, and Global-Scale Impacts of Air Pollutants, 82nd Annual Meeting of the American Meteorological Society, Orlando, Florida, January 14, 2002.

Zhang, Z., Cheng, L., Fenter, P., Sturchio, N.C., Bedzyk, M.J., Machesky, M.L., Anovitz, L.M., and Wesolowski, D.J., "Ionic Strength Dependence of Ion Adsorption at the Rutile/Aqueous Interface Using High-Brilliance X-rays," 11th Users Meeting for the APS, Argonne National Laboratory, Argonne, Illinois, October 10, 2001.

7. Patents Issued

None.

**Publications/Presentations
Fiscal Year 2003**

Environmental Research Division

1. Refereed Publications

Allison, V.J., "Nutrients, Arbuscular Mycorrhizas, and Competition Interact to Influence Seed Production and Germination Success in *Achillea millefolium*," *Functional Ecology* 16:742-749 (2002).

Allison, V.J., and Goldberg, D.E., "Species-Level versus Community-Level Patterns of Mycorrhizal Dependence on Phosphorus: An Example of Simpson's Paradox," *Functional Ecology* 16:346-352 (2002).

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LaFreniere, L.M., "Application of Cone Penetrometer Technology to Environmental Site Characterization," Industrial Partners Committee Meeting, Argonne National Laboratory, Argonne, Illinois, June 7, 2004.

LaFreniere, L.M., "The Use of Cone Penetrometer Technology in Environmental Site Characterization and Remediation," Course/Seminar: Cone Penetrometer Testing (CPT) in Geotechnical and Environmental Practice, Argonne National Laboratory, Argonne, Illinois, August 20, 2004.

Lesht, B.M., "ARM Radiosondes in AWEX-G," Participants' Kick-off Meeting for the AWEX-G IOP, U.S. Department of Energy, Billings, Oklahoma, October 27, 2003.

Lesht, B.M., "Using Ocean Color Monitoring Satellites in Process Studies of the Great Lakes," Pegrum Lecture Series, University at Buffalo, State University of New York, Buffalo, New York, March 12, 2004.

Lesht, B.M., "Welcome," Global Change Education Program Orientation, Argonne National Laboratory, Argonne, Illinois, June 6, 2004.

Lesht, B.M., Miloshevich, L.M., and Liljegren, J.C., “Comparison of Observed Upper-Air Temperature and Relative Humidity Climatology at NSA, SGP, and TWP Climate Research Sites with ECMWF Model Analyses,” Fourteenth ARM Science Team Meeting, Albuquerque, New Mexico, March 22–26, 2004.

Li, S.-S., Stols, L., Donnelly, M.I., and Giometti, C.S., “Detection and Characterization of Complexes Using Proteomics Methods,” Chicago Biomedical Consortium Proteomics Workshop, University of Illinois at Chicago, Chicago, Illinois, April 17, 2004.

Liao, J.D., Boutton, T.W., and Jastrow, J.D., “Woody Plant Invasion of Grassland: Storage and Turnover of Carbon in Soil Physical Fractions,” American Geophysical Union 2003 Fall Meeting, San Francisco, California, December 8-12, 2003.

Liljegren, J.C., “Capabilities and Status of the Radiometrics 89/150 GHz Microwave Radiometer,” ARM Instantaneous Radiative Fluxes Working Group Meeting, U.S. Department of Energy, Broomfield, Colorado, October 29, 2003.

Liljegren, J.C., “Improved Retrievals of Temperature and Water Vapor Profiles with a Twelve-Channel Microwave Radiometer,” Eighth Symposium on Integrated Observing and Assimilation Systems for Atmosphere, Oceans, and Land Surface (IQAS-AOLS), 84th National Meeting of the American Meteorological Society, Seattle, Washington, January 12, 2004.

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Liljegren, J.C., “The Twelve-Channel Microwave Radiometer: An Overview,” ARM Cloud Parameterization and Modeling Working Group Meeting, U.S. Department of Energy, Broomfield, Colorado, October 28, 2003.

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Marley, N.A., “Nancy’s Global Change Hot Topic — 2004!” Global Change Education Program Orientation, Argonne National Laboratory, Argonne, Illinois, June 11, 2004.

Marley, N.A., and Gaffney, J.S., “Argonne Ammonia Measurements at CENICA and PAN/NO₂ Data Sets,” MCMA Field Measurements Campaign Data Analysis Workshop, Massachusetts Institute of Technology, Cambridge, Massachusetts, January 7, 2004.

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Matamala, R., “Tracking Carbon Sequestration with Isotopes,” Global Change Education Program Orientation, Argonne National Laboratory, Argonne, Illinois, June 8, 2004.

Matamala, R., Allison, V.J., Kirt, S., Miller, R.M., and Jastrow, J.D., “Effects of Elevated Atmospheric CO₂ and O₃ on Root Length and Mycorrhizal Colonization,” Annual SoyFACE Investigators Meeting, University of Illinois, Urbana-Champaign, Illinois, February 11, 2004.

McCarthy, J.F., Perfect, E., Mayer, L.M., and Jastrow, J.D., “Determining the Nanoscale Morphology of Soil Microaggregates Using Small Angle Scattering,” Annual Meetings of the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, Denver, Colorado, November 2-6, 2003.

Meyer, H., O’Loughlin, E.J., Sholto-Douglas, D.J., and Kemner, K.M., “Electron Donor Effects on the Reduction of AQDS by Several *Shewanella* Species,” American Society of Microbiology National Meeting, New Orleans, Louisiana, May 23–27, 2004.

Miller, R.M., “Fermilab Prairie Restoration Facility,” Global Change Education Program Orientation, Argonne National Laboratory, Argonne, Illinois, June 8, 2004.

Miloshevich, L.M., Lesht, B.M., and Ritsche, M., “New Surface Meteorological Measurements at SGP, and Their Use for Assessing Radiosonde Measurement Accuracy,” Fourteenth ARM Science Team Meeting, Albuquerque, New Mexico, March 22–26, 2004.

Miloshevich, L.M., Lesht, B.M., and Voemel, H., “Evaluation of ARM Radiosonde Humidity Measurements and Proposed Corrections Based on AWEX Radiosonde Intercomparisons,” Fourteenth ARM Science Team Meeting, Albuquerque, New Mexico, March 22–26, 2004.

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Nagy, K.L., Schlegel, M.L., Fenter, P., and Sturchio, N.C., "Sorption Structures at the Mica-Water and Quartz-Water Interfaces," 227th American Chemical Society National Meeting, Anaheim, California, March 28–April 1, 2004.

Nagy, K.L., Sturchio, N.C., Schlegel, M.L., and Fenter, P., "Cation Sorption at the Muscovite-Water Interface Using X-ray Reflectivity," Eleventh International Symposium on Water-Rock Interaction, Saratoga Springs, New York, June 28, 2004.

O'Loughlin, E., Scherer, M.M., Kemner, K.M., and Kelly, S.D., "Investigation of the Transformation of Uranium under Iron-Reducing Conditions: Reduction of U(VI) by Biogenic Fe(II)/Fe(III) Hydroxide (Green Rust)," Seventh Annual DOE-NABIR PI Workshop, U.S. Department of Energy, Office of Biological and Environmental Research, Natural and Accelerated Bioremediation Program, Warrenton, Virginia, March 15–17, 2004.

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Pekour, M.S., "Experiences with the WindMaster Pro Sonic Anemometer," 12th International Symposium on Acoustic Remote Sensing and Associated Techniques of the Atmosphere and Oceans (ISARS 12), Cambridge, United Kingdom, July 11–16, 2004 .

Pekour, M.S., "New Eddy Correlation System for ARM SGP Site," Fourteenth ARM Science Team Meeting, Albuquerque, New Mexico, March 22–26, 2004.

Pekour, M., and Cook, D.R., "Walnut River Watershed Site, Kansas," AmeriFlux 2003 Science Meeting, Boulder, Colorado, October 14-16, 2003.

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Sedivy, R.A., and Gilmore, S.M., "Restoration of Natural Wetlands and Remediation of Contaminated Groundwater Using Spray Irrigation," Soil and Water Conservation Society, 59th Annual Conference, St. Paul, Minnesota, July 24–28, 2004.

Sholto-Douglas, D.J., Meyer, H., Donnelly, M., O'Loughlin, E.J., Roden, E.E., and Kemner, K.M., "Investigation of Dissimilatory Iron Reduction in a Mixed Culture of *Shewanella oneidensis* and *Geobacter sulfurreducens*," American Society of Microbiology National Meeting, New Orleans, Louisiana, May 23–27, 2004.

Sisterson, D.L., "ARM Operations Report: You Manage What You Measure," ARM Coordination Team Meeting, U.S. Department of Energy, Alexandria, Virginia, November 18, 2003.

Sisterson, D.L., "ARM Overview," Global Change Education Program Orientation, Argonne National Laboratory, Argonne, Illinois, June 10, 2004.

Sisterson, D.L., "Evolution of DOE's ARM/CART Sites: Perspectives on Managing a Multi-Agency, Multi-Objective Program," Argonne Partnership Committee Meeting, Argonne National Laboratory, Argonne, Illinois, December 1, 2003.

Sisterson, D.L., "How Do Scientists Do What They Do?" Global Change Education Program Orientation, Argonne National Laboratory, Argonne, Illinois, June 10, 2004.

Sisterson, D.L., "Operations Status Report," ARM Science Team Executive Committee Meeting, Albuquerque, New Mexico, March 16, 2004.

Sisterson, D.L., "Perspectives on Managing Multi-Agency, Multi-Pronged Programs," Carbon Cycle Science Steering Group Meeting, U.S. Department of Energy, Washington, D.C., November 13, 2003.

Sisterson, D.L., "What Do Scientists Do?" Churchville Middle School, Elmhurst School District, Elmhurst, Illinois, February 2–3, 2004.

Sisterson, D.L., "Who Are Scientists and How Do They Do What They Do?" Take Your Sibling to Work Day Symposium, Argonne National Laboratory, Argonne, Illinois, April 22, 2004.

Sisterson, D.L., "Who Are Scientists, and What Do They Do?" Chicago Public School System, Morton East High School, Cicero, Illinois, January 28, 2004.

Sisterson, D.L., "Wild Weather," Jerling Junior High School, Orland Park, Illinois, March 12, 2004.

Sisterson, D.L., and Liljegren, J.C., “ARM Sites and Instruments,” Global Change Education Program Orientation, Argonne National Laboratory, Argonne, Illinois, June 10, 2004.

Sisterson, D.L., and Nega, N., “Weather or Not,” Science Olympics, Edison School, Elmhurst, Illinois, March 3, 2004.

Turner, D.D., Clough, S.A., Cady-Pereira, K., Clothiaux, E.E., Liljegren, J.C., Mlawer, E.J., and Gaustad, K.L., “Improved PWV and LWP Retrievals from the Microwave Radiometer for ARM,” Fourteenth ARM Science Team Meeting, Albuquerque, New Mexico, March 22–26, 2004.

Van Hove, T., Liljegren, J.C., Rocken, C., and Braun, J., “Using GFS Weather Model to Reduce Diurnal Differences between GPS PW and ARM MWR PW,” Fourteenth ARM Science Team Meeting, Albuquerque, New Mexico, March 22–26, 2004.

Wesolowski, D.J., Anovitz, L.M., Benezeth, P., Chialvo, A.A., Palmer, D.A., Fenter, P., Cheng, L., Sturchio, N.C., Zhang, Z., Bedzyk, M.J., Kubicki, J.D., Fedkin, M.V., Lvov, S.N., Sykes, D., Cummings, P.T., Ridley, M.K., Machesky, M.L., Predota, M., Bandura, A.V., “Temperature Effects and Structure at the Rutile-Water Interface,” Eleventh International Symposium on Water-Rock Interaction, Saratoga Springs, New York, June 28, 2004.

Westwater, E.R., Klein, M., Gasiewski, A., Leuski, V., Shaw, J., Liljegren, J.C., and Lesht, B.M., “The 2004 North Slope of Alaska Arctic Winter Radiometric Experiment,” Eighth Specialist Meeting on Microwave Radiometry and Remote Sensing Applications, Rome, Italy, February 24-27, 2004.

Westwater, E.R., Klein, M., Gasiewski, A., Leuski, V., Shaw, J., Mattioli, V., Cimini, D., Liljegren, J.C., Lesht, B.M., and Zak, B.D., “The 2004 North Slope of Alaska Arctic Winter Radiometric Experiment,” Fourteenth ARM Science Team Meeting, Albuquerque, New Mexico, March 22–26, 2004.

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Yan, Y.E., “Short Course: Groundwater and Surface Water Modeling Using GMS and WMS,” United Nations Development Program, Cairo University, Cairo, Egypt, December 29, 2003-January 5, 2004.

Yan, Y.E., Ballerstein, E., Sultan, M., and Becker, R., “Hydrologic Impacts of Lake Nasser and the Tushka Lakes on the Nubian Aquifer in SW Egypt,” Geological Society of America Annual Meeting, Seattle, Washington, November 4, 2003.

Yan, Y.E., Becker, R., Sultan, M., and Ballerstein, E., “Development of Tushka Lakes in the Southwestern Desert of Egypt,” Geological Society of America Annual Meeting, Seattle, Washington, November 4, 2003.

Zhang, Z., Fenter, P., Bedzyk, M.J., Sturchio, N.C., Machesky, M.L., and Wesolowski, D.J., "Atomic Structure at the Rutile TiO₂ (110)-Aqueous Interface with Crystal Truncation Rod Measurements," 227th American Chemical Society National Meeting, Anaheim, California, March 28–April 1, 2004.

Zhang, Z., Fenter, P., Sturchio, N.C., Bedzyk, M.J., Machesky, M.L., and Wesolowski, D.J., "X-ray Standing Wave Imaging of Ion Adsorption at the Rutile-Aqueous Solution Interface," Advanced Photon Source Users Meeting, Argonne, Illinois, May 3–6, 2004.

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7. Patents Issued

Burton, J.C., "Method for Performing Environmental Site Characterization," 6,782,321, August 24, 2004.

Donnelly, M.I., and Joachimiak, A., "Methods for Production of Proteins in Host Cells," 6,677,139, January 13, 2004.

Donnelly, M.I., Sanville Millard, C.Y., and Nghiem, N., "Method to Produce Succinic Acid from Raw Hydrolysates," 6,743,610, June 1, 2004.

LaFreniere, L.M., and Surgnier, D.H., "Air Delivery System for a Direct Push Drilling Swivel," 6,763,901, July 20, 2004.

Walker, J.L., Nashold, B.W., and Burton, J.C., "System and Method for Detecting Contamination Using Vegetation Sampling," 6,729,801, May 4, 2004.

**Publications/Presentations
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Environmental Research Division

1. Refereed Publications

Allison, V.J., and Miller, R.M., "Soil Grinding Increases the Relative Abundance of Eukaryotic Phospholipid Fatty Acids," *Soil Science Society of America Journal* 69:423-426 (2005).

Allison, V.J., Miller, R.M., Jastrow, J.D., Matamala, R., and Zak, D.R., "Changes in Soil Microbial Community Structure in a Tallgrass Prairie Chronosequence," *Soil Science Society of America Journal* 69:1412-1421 (2005).

Berkowitz, C.M., Spicer, C.W., and Doskey, P.V., "Hydrocarbon Observations and Ozone Production Rates in Western Houston during the Texas 2000 Air Quality Study," *Atmospheric Environment* 39:3383-3396 (2005).

Chattopadhyay, S., Kelly, S.D., Palkar, V.R., Fan, L., and Segre, C.U., "Investigation of Size Effects in the Magnetoelectric BiFeO₃ Systems," *Physica Scripta* T115:709-713 (2005).

Fenter, P., and Park, C., "Termination Interference along Crystal Truncation Rods of Layered Crystals," *Journal of Applied Crystallography* 37:977-987 (2004).

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Fenter, P., and Zhang, Z., "Model-Independent One-Dimensional Imaging of Interfacial Structures at $< 1 \text{ \AA}$ Resolution," *Physical Review B, Rapid Communications* 72 081401(R, 1-4) (2005).

Ferrare, R., Browell, E.V., Ismail, S., Kooi, S.A., Brasseur, L.H., Brackett, V.G., Clayton, M.B., Barrick, J.D.W., Diskin, G.S., Goldsmith, E.M., Lesht, B.M., Podolske, J.R., Sachse, G.W., Schmidlin, F.J., Turner, D.D., Whiteman, D.N., Tobin, D., Miloshevich, L.M., and Revercomb, H.E., "Characterization of Upper Tropospheric Water Vapor Measurements during AFWEX Using LASE," *Journal of Atmospheric and Oceanic Technology* 21(12):1790-1808 (2004).

Fryxell, G.E., Lin, Y., Fiskum, S., Birnbaum, J.C., Wu, H., Kemner, K., and Kelly, S., "Actinide Sequestration Using Self-Assembled Monolayers on Mesoporous Supports," *Environmental Science and Technology* 39:1324-1331 (2005).

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Gaffney, J.S., Marley, N.A., Cunningham, M.M., and Kotamarthi, V.R., "Beryllium-7 Measurements in the Houston and Phoenix Urban Areas: An Estimation of Upper

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Graham, J.H., and Miller, R.M., “Mycorrhizas: Gene to Function,” *Plant and Soil* 274:79-100 (2005).

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Miller, R.M., “The Nonmycorrhizal Root — A Strategy for Survival in Nutrient Impoverished Soils,” *New Phytologist* 165:655-658 (2005).

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2. Books, Book Chapters, and Collections of Conference Proceedings (Unrefereed)

None.

3. Reports

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