

**Publications/Presentations
Fiscal Year 2002**

Environmental Research Division

1. Refereed Publications

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Choi, H., Lim, H.-N., Kang, J.-W., Hwang, T.-M., and Kim, J., "Transport Characteristics of Gas Phase Ozone in Unsaturated Porous Media for In-Situ Chemical Oxidation," *Journal of Contaminant Hydrology* 57(1-2):81-98 (2002).

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Dieckman, L., Gu, M., Stols, L., Donnelly, M.I., and Collart, F.R., "High Throughput Methods for Gene Cloning and Expression," *Protein Expression and Purification* 25:1-7 (2002).

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Keihm, S.J., Bar-Sever, Y., and Liljegren, J.C., "WVR-GPS Comparison Measurements and Calibration of the 20-32 GHz Tropospheric Water Vapor Absorption Model," *IEEE Transactions on Geoscience and Remote Sensing* 40(6):1199-1210 (2002).

Kim, J., and Choi, H., "Modeling *In Situ* Ozonation for the Remediation of Nonvolatile PAH-Contaminated Unsaturated Soils," *Journal of Contaminant Hydrology* 55(3-4):261-285 (2002).

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

None.

3. Reports

Boyanov, M.I., Kelly, S.D., Bunker, B.A., Kemner, K.M., and Fein, J.B., "EXAFS of Cadmium Acetate Aqueous Solutions," in *Advanced Photon Source Activity Report 2000*, ANL-01/03, <http://www.aps.anl.gov/apsar2000/boyanov1.pdf> (2001).

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Kelly, S.D., Kemner, K.M., Fryxell, G.E., Liu, J., Mattigod, S.V., and Ferris, K.F., "XAFS Study of the Binding Geometry of Oxometallate Anions to Self-Assembled Monolayers on Mesoporous Supports," in *Advanced Photon Source Activity Report 2000*, ANL-01/03, <http://www.aps.anl.gov/apsar2000/skelly2.pdf> (2001).

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4. Unrefereed Conference Papers

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5. Published Abstracts, Notes, Reviews, Comments, and Letters

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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.

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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.

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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.

Liljegren, 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 PM_{2.5} 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.

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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.

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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.

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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.

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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.

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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.

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.