

JEFFREY R. WHITE

Professor Emeritus
Environmental Science
O'Neill School of Public and Environmental Affairs
& Department of Earth & Atmospheric Sciences
Indiana University

MSB II Room 412, Bloomington, IN, USA 47405

Tel: 812-856-0084 Email: whitej@indiana.edu

SPEA link: <https://spea.indiana.edu/faculty-research/directory/profiles/full-time/white-jeffrey.html>

EDUCATION

Graduate: Ph.D., Civil Engineering, Syracuse University, 1984
M.S., Environmental Science, Rutgers University, 1979

Undergraduate: B.A., Biology, Gettysburg College, PA, 1977

UNIVERSITY ADMINISTRATION

- 2012-2018 Director, Integrated Program in the Environment, Indiana University
- Founding director; provide academic leadership for campus-wide program that integrates academic programs and research spanning environmental sciences and sustainability studies
- 2010-2012 Co-chair, Indiana University Campus Sustainability Advisory Board
- Provided academic and operational oversight of IU Office of Sustainability
- 2006-2009 Associate Vice Provost for Research, Indiana University
- Responsible for research development in physical, natural and life sciences
- Responsible for Lab Animal Resources program on Bloomington campus
- Research Integrity Officer, Bloomington campus
- Directed Faculty Research Support Program
- Coordinated IUB Limited Submissions
- Guided establishment of Center for Research in Environmental Sciences
- Guided establishment of Light Microscopy Imaging Center
- Member, design team for Multidisciplinary Science Building II
- Member, design team for IU Research and Teaching Preserve Field Lab
- Directed modernization of Bloomington campus laboratory animal research program
- Provided administrative oversight of Center for Genomics and Bioinformatics
- Provided administrative oversight of Anthropological Center for Training and Research on Global Environmental Change
- Provided administrative oversight of Indiana Geological Survey
- Provided administrative oversight of Indiana Molecular Biology Institute
- Co-chair, IU HBCU STEM Initiative
- 2001-2005 Associate Dean, School of Public and Environmental Affairs, Indiana University
- Responsible for academic and administrative operations of Bloomington programs
- Guided effort to strengthen campus integration of environmental sciences
- Provided administrative oversight of IU Commitment to Excellence recruitment of faculty in environmental sciences
- Member, planning committee for Multidisciplinary Science Building I (Simon Hall)

1994 - 1997 Chair, Environmental Science and Policy Faculty, School of Public and Environmental Affairs, Indiana University

1991 - 1993 Director, Ph.D. Program in Environmental Science, Indiana University

ACADEMIC APPOINTMENTS

2020 - present Professor Emeritus, School of Public and Environmental Affairs and Department of Earth and Atmospheric Sciences, Indiana University

1998 - 2019 Full Professor, School of Public and Environmental Affairs and Department of Earth and Atmospheric Sciences, Indiana University

2018 - 2019 Visiting Professor, Institute of Ecology and Evolution, University of Oregon

2001 Visiting Professor, Earth Sciences, Flinders University, Adelaide, Australia

1993 - 1994 Visiting Professor, Marine Science, University of North Carolina, Chapel Hill

1990 – 1998 Associate Professor, School of Public and Environmental Affairs and Department of Geological Sciences (adjunct), Indiana University

1988 - 1990 Assistant Professor, Department of Geological Sciences (adjunct), Indiana University

1983 - 1990 Assistant Professor, School of Public and Environmental Affairs, Indiana University

HONORS

Indiana University Bicentennial Medal, 2020

Indiana University Distinguished Faculty Research Lecturer, 2018

Fellow, CIC Academic Leadership Program, US Committee on Institutional Cooperation

Selected Chair, Biogeosciences Division, American Geophysical Union, International Joint Session 2007

City of Bloomington Outstanding Service Award, Utilities Service Board, 2004

Indiana University Faculty Excellence in Teaching Award, 1998

Indiana University Trustees Teaching Excellence Recognition Award, 1997, 1998

School of Public and Environmental Affairs Graduate Teaching Award, 1989

Elected IU Chapter President, Sigma Xi, The Scientific Research Society, 1988

Indiana University Outstanding Young Faculty Award, 1987

OTHER APPOINTMENTS AND PROFESSIONAL CONSULTANTSHIPS

Indiana University Delegate to the Committee on Institutional Cooperation's Convention (CIC) on "Setting the Stage for Culturally Inclusive Classes," Penn State University, April, 2005.

City Council appointee, City of Bloomington Utilities Service Board, 1990-2004; President, 2000-2002; Chair of PCB Remediation Consent Decree Subcommittee & Engineering Subcommittee.

Gubernatorial appointee, Indiana Interagency Watershed Task Force, 1992-1996.

Indiana University Representative, “University Colloquium on Environmental Research and Education”, North Carolina State University, September 1992; sponsored by Duke U., U. of Michigan, NASA, UNC, NC State, and Sigma Xi, The Scientific Research Society.

Member, White River Basin Liaison Committee, National Water Quality Assessment Program, US Geological Survey, 1991-1999.

Indiana University Delegate to the “International Convention on the Public Understanding of Science and Technology,” October 1988, Orlando, Fl. Annual meeting of the American Association for the Advancement of Science and Sigma Xi, The Scientific Research Society.

Technical Consultant, National Acidic Precipitation Assessment Program (NAPAP), Environmental Protection Agency, 1985-1988.

PROFESSIONAL SOCIETIES

National Council for Science and the Environment
Council of Environmental Deans and Directors
American Chemical Society, Environmental Chemistry Division
American Geophysical Union, Biogeosciences Division

TEACHING PORTFOLIO

Aquatic Chemistry, Environmental Engineering, Limnology,
Environmental Chemistry, Introduction to Environmental Science

PUBLICATIONS

Refereed Publications

Cadieux, S.B., Schuette, U.M.E., Hemmerich, C., Powers, S., White, J.R., “Exploring extreme C and H isotope enrichment of methane in an arctic lake in Kangerlussuaq Greenland using stable isotopes and 16S rRNA gene sequencing,” Frontiers in Environmental Science, abstract accepted – manuscript in review.

Mushinski, R.M., Payne, Z.C., Raff, J.D., Craig, M.E., Pusede, S.E., Rusch, D.B., White, J.R., and Phillips, R.P., "Nitrogen cycling microbiomes are structured by plant mycorrhizal associations, with consequences for nitrogen oxide fluxes in forests”, Global Change Biology, 2020, Vol. 27, No. 5, 1068-1082. DOI: 10.1111/gcb.15439; <https://onlinelibrary.wiley.com/doi/full/10.1111/gcb.15439>.

Burns, S.E., Morgan, J.A., White, J.R., and Royer, T.V., “Macroinvertebrate response to fine sediment removal and streambed restoration in the fawn River, Steuben County, Indiana,” Proceedings of the Indiana Academy of Science, 2019, Vol. 128, No. 2, 170–186.

Mushinski, R.M., Phillips, R.P., Payne, Z.C., Pusede, S.E., Rusch, D.B., White, J.R., and Raff, J.D. "Variation in soil microbial nitrogen-cycling community structure relates to mycorrhizal dominance with consequences for nitrogen oxide emissions," ISME Journal, 2019, ISMEJ-19-01167A.

Morgan, J.A., White, J.R., and Royer, T.V., “Fine sediment removal influences biogeochemical processes in a gravel-bottomed stream,” Environmental Management, 2019, DOI: 10.1007/s00267-019-01187-2.

Schütte, U.M.E., J.A. Henning, Y. Ye, A. Bowling, J. Ford, H. Genet, M. Waldrop, M. Turetsky, J.R. White, J.D. Bever, "Effect of permafrost thaw on plant and soil fungal community in the boreal forest: Does fungal community change mediate plant productivity response?," Journal of Ecology, 2019, Vol 107, No. 4, 1737-1752.

Mushinski, R.M., Phillips, R.P., Payne, Z.C., Abney, R.B., Jo, I., Fei, S., Pusede, S.E., White, J.R., Rusch, D.B., Raff, J.D. "Microbial mechanisms and ecosystem flux estimation for aerobic NO_y emissions from deciduous forest soils," PNAS, 2019, 1-8. <https://doi.org/10.1073/pnas.1814632116>.

Young, S.A., Cadieux, S.B., Y. Peng, J.R. White, and L.M. Pratt, "Seasonal changes in sulfur biogeochemistry of a dilute, dimictic Arctic lake: Implications for paired sulfur isotope records from ancient oceans," Chemical Geology, 2018, DOI: 10.1016/j.chemgeo.2018.08.013.

Ward, A., Morgan, J., White, J.R., and Royer, T.V., "Streambed Restoration to Remove Fine Sediment Alters Reach-Scale Transient Storage in a Low-Gradient 5th Order River, Indiana, USA," Hydrological Processes, 2018, 1-15. <https://doi.org/10.1002/hyp.11518>.

Thompson, H.A., L.M. Pratt, and J.R. White, "Spatial Variation in Stable Isotopic Composition of Organic Matter of Macrophytes and Sediments from a Small Arctic Lake in West Greenland," Arctic, Antarctic and Alpine Research, 2018, Vol. 50, No 1, ID1420282.

Cadieux, S.B., J.R. White, and L.M. Pratt, "Exceptional summer warming leads to contrasting outcomes for methane cycling in small Arctic lakes of Greenland," Biogeosciences, 2017, 559–574.

Thompson, H.A., J.R. White, L.M. Pratt, and P.E. Sauer, "Spatial Variation in Flux, $\delta^{13}\text{C}$ and $\delta^2\text{H}$ of Methane in a Small Arctic Lake with Fringing Wetland in Western Greenland," Biogeochemistry, 2016, BIOG-D-16-00065R1.

Chen, Y, Kevin K. Lehmann, Y. Peng, L.M. Pratt, J.R. White, S.B. Cadieux, B. Sherwood Lollar, G. Lacrampe Couloume, and T.C. Onstott. "Hydrogen Isotopic Composition of Arctic and Atmospheric CH₄ Determined by a Portable Near-infrared Cavity Ring-down Spectrometer with a Cryogenic Pre-concentrator," Astrobiology, 2016, Vol. 16, No 16, DOI: 10.1089/ast.2015.1395.

Schütte, U.M.E., S.B. Cadieux, C. Hemmerich, L.M. Pratt, J.R. White, "Unanticipated Geochemical and Microbial Community Structure Under Seasonal Ice Cover in a Dilute, Dimictic Arctic Lake," Frontiers in Microbiology, 2016, Vol. 7, 1035. doi: 10.3389/fmicb.2016.01035.

Cadieux, S.B., White, J.R., P.E. Sauer, Y. Peng, A.E. Goldman, and Pratt, L.M., "Large Fractionations of C and H Isotopes Related to Methane Oxidation in Arctic Lakes," Geochimica et Cosmochimica Acta, 2016, Vol. 187, 141-155.

Goldman, A.E., Cadieux, S.B., White, J.R., and L.M. Pratt, "Passive Sampling Method for High-resolution Concentration and Isotopic Composition of Dissolved Methane in Arctic Lakes," Limnology and Oceanography: Methods, 2016, Vol. 14, 69–78. doi: 10.1002/lom3.10070.

Scharko, N. K., Schuette, U. M. E., Berke, A. E., Banina, L., Peel, H. R., Donaldson, M. A., Hemmerich, C., White, J. R., Raff, J. D., "Combined Flux Chamber and Genomics Approach Links Nitrous Acid Emissions to Ammonia Oxidizing Bacteria and Archaea in Urban and Agricultural Soil," Environmental Science & Technology, 2015, Vol. 49, 13825–13834.

Colcord, D.E., Cadieux, S.B., Brassell, S.C., Castañeda, S., Pratt, L.M. and White, J.R., "Assessment of Branched GDGTs as Temperature Proxies in Sedimentary Records from Several Small Lakes in Southwestern Greenland," Organic Geochemistry, 2015, Vol. 82, 33-41.

Webster, K.D., White, J.R., and Pratt, L.M., "Evaluating Ground-level Atmospheric Methane Concentrations in Southwest Greenland Using Open-Path Laser Spectroscopy," Arctic, Antarctic, and Alpine Research, 2015, Vol. 47, 599-609.

Turetsky, M.R., Kotowska, A., Bubier, J., Dise, N.B., Crill, P., Hornibrook, E., Minkinen, K., Moore, T.R., Myers-Smith, I.H., Nykänen, H., Olefeldt, D., Rinne, J., Saarnio, S., Shurpali, N., Tuittila, E., Waddington, J.M., White, J.R., Wickland, K., and Wilmking, M., "A Synthesis of Methane Emissions from 71 Northern, Temperate, and Subtropical Wetlands," Global Change Biology, 2014, Vol. 20, 2183–2197.

White, J.R., Shannon, R.D., Weltzin, J.F., Pastor, J. and Bridgman, S.D. "Stable isotopic evidence of climate-driven changes in methane cycling in northern peatlands. Geochimica et Cosmochimica Acta, 2010, Vol. 74, pp. A1128-A1128.

Tang, J., Zhuang, Q., Shannon R.D., and White, J.R. "Quantifying Wetland Methane Emissions with Process-Based Models of Different Complexities," Biogeosciences, 2010, Vol. 7, 3817-3837.

White, J.R., Shannon, R.D., Weltzin, J.F., Pastor, J., and Bridgman, S.D. "Effects of Soil Warming and Drying on Methane Cycling in a Northern Peatland Mesocosm Study," J. Geophysical Research: Biogeosciences, 2008, Vol. 113, G00A06, doi:10.1029/2007JG000609.

Herrman, K.S., and White, J.R. "Denitrification in a Constructed Wetland: Comparison of Mass Balance and Stable Isotopic Methods," Applied Geochemistry, 2008, doi:10.1016/j.apgeochem.2008.04.024.

Keller, J.K., White, J.R., Bridgman, S.D., and Pastor, J. "Climate Change Effects on Carbon and Nitrogen Mineralization in Peatlands through Changes in Soil Quality." Global Change Biology, 2004, Vol. 10, 1053-1064.

Avery, B., Shannon, R.D., White, J.R., Martens, C.S., and Alperin, M.J. "Controls on Methane Production in a Tidal Freshwater Estuary and a Peatland: Methane Production via Acetate Fermentation and CO₂ Reduction," Biogeochemistry, 2002, Vol. 62, 19-37.

Avery, B., Shannon, R.D., White, J.R., Martens, C.S., and Alperin, M.J., "Effect of Seasonal Changes in the Pathways of Methanogenesis on the $\delta^{13}\text{C}$ Values of Pore Water Methane in a Michigan Peatland," Global Biogeochemical Cycles, 1999, Vol. 13, 475-484.

White, J.R., and Shannon, R.D., "Modeling Organic Solutes in Peatland Soils Using Acid Analogs," Soil Science Society of America Journal, 1997, Vol. 61, 1257-1263.

Walter, B.P., Heimann, M., Shannon, R.D., and White, J.R., "A Process-based Model to Derive Methane Emissions from Natural Wetlands," Geophysical Research Letters, 1996, Vol. 23, 3731-3734.

Shannon, R.D., and White, J.R., "The Effects of Spatial and Temporal Variations in Acetate and Sulfate on Methane Cycling in Two Michigan Peatlands," Limnology and Oceanography, 1996, Vol. 41, 435-443.

Shannon, R.D., White, J.R., Lawson, J.E., and Gilmour, B.S., "Methane Efflux from Emergent Vegetation in Peatlands," Journal of Ecology, 1996, Vol. 84, 239-246.

Shannon, R.D., and White, J.R., "A Three-Year Study of Controls on Methane Emissions From Two Michigan Peatlands," Biogeochemistry, 1994, Vol. 27, 35-60.

Shannon, R.D., and White, J.R., "The Selectivity of a Sequential Extraction Procedure for Iron Oxyhydroxide and Sulfides in Freshwater Sediments," Biogeochemistry, 1991, Vol. 14, 193-208.

Gubala, C.P., Engstrom, D.R., and White, J.R., "Effects of Iron Cycling on ^{210}Pb Dating of Sediments in an Adirondack Lake, U.S.A." Canadian Journal of Fisheries and Aquatic Sciences, 1990, Vol. 47, 1821-1829.

White, J.R., and Gubala, C.P., "Sequentially Extracted Metals from Adirondack Lake Sediment Cores," Journal of Paleolimnology, 1990, Vol. 3, 243-252.

Charles, D., Binford, M., Furlong, E., Hites, R., Mitchell, M., Norton, S., Oldfield, F., Paterson, M., Smol, J., Uutala, A., White, J., Whitehead, D., and Wise, R., "Paleoecological Investigation of Recent Lake Acidification in the Adirondack Mountains, N.Y.," Journal of Paleolimnology, 1990, Vol. 3, 195-241.

White, J.R., Gubala, C.P., Fry, B., Owen, J., and Mitchell, M.J., "Sediment Biogeochemistry of Iron and Sulfur in an Acidic Lake", Geochimica et Cosmochimica Acta, 1989, Vol. 53, 2547-2559.

White, J.R., and Driscoll, C.T., "Zinc Cycling in an Acidic Adirondack Lake," Environmental Science and Technology, 1987, Vol. 21, 211-216.

White, J.R., and Driscoll, C.T., "Manganese Cycling in an Acidic Adirondack Lake," Biogeochemistry, 1987, Vol. 3, 87-103.

White, J.R., "The Particle/Solution Chemistry of Lead in Acidic Lake Systems," in: The Chemical Quality of Water and the Hydrologic Cycle, Lewis Publishers, Ann Arbor, MI., 1987, pp. 211-234.

Gubala, C.P., and White, J.R., "Processes at the Sediment/Water Interface and Their Significance in Aluminum and Trace Metal Chemistry of an Acidic Lake," in: The Chemical Quality of Water and the Hydrologic Cycle, Lewis Publishers, Ann Arbor, MI., 1987, pp. 235-249.

Charles, D.F., Whitehead, D.R., Engstrom, D.R., Fry, B.D., Hites, R.A., Norton, S.A., Owen, J., Roll, L.A., Schindler, S., Smol, J.P., Uutala, A.J., White, J.R., and Wise, R.J. "Paleolimnological evidence for recent acidification of Big Moose Lake, Adirondack Mountains, N.Y. (U.S.A.)." Biogeochemistry, 1987, Vol. 3, 267-296.

Charles, D.F., Whitehead, D.R., Anderson, D., Bienert, R., Camburn, K., Cook, R., Crisman, T., Davis, R., Fry, B., Hites, R.A., Kahl, J., Kingston, J., Kreis, R., Mitchell, M., Norton, S., Roll, L., Smol, J., Sweets, P., Uutala, A., White, J., Whiting, M., and Wise, R. "The PIRLA project (Paleoecological Investigation of Recent Lake Acidification): Preliminary results for the Adirondacks, New England, N. Great Lakes States, and N. Florida." Water Air and Soil Pollution, 1986, Vol. 30, 355-365.

White, J.R., and Driscoll, C.T., "Lead Cycling in an Acidic Adirondack Lake," Environmental Science and Technology, 1985, Vol. 19, 1182-1187.

Schafran, G.C., White, J.R., and Driscoll, C.T., "The Response of Dilute Acidic Surface Waters to Strong Base Addition," Northeastern Environmental Science, 1982, Vol. 1, 151-160.

Driscoll, C.T., White, J.R., Schafran, G.C., and Rendall, J.D., Calcium Carbonate Neutralization of Acidified Surface Waters in the Adirondack Region of New York State,” Journal of Environmental Engineering, 1982, Vol. 108, 1128-1145.

Published Proceedings, Abstracts and Conference Papers

Mushinski, R. M., Raff, J. D., Phillips, R., Payne, Z., Pusede, S., Rusch, D., White, J. R. “A microbiological perspective on forest soil emissions of nitrogen oxides in a changing world” Abstract, American Geophysical Union, #A32D-02, December 2019.

Mushinsk, RM, Phillips, RP, Payne, ZC, Abney, RB, Jo, I, Fei, S, Pusede, SE, White, JR, Rusch, DB, Raff, JD. “Microbial mechanisms and ecosystem flux estimation for aerobic NO_y emissions from deciduous forest soils.” Abstracts, 2018-2019 SSSA International Soils Meeting.

Cadieux, S.B., Schütte, U.M.E, White, J. R., and Pratt, L.M. “Understanding extreme isotope enrichment caused by methane oxidation,” Geological Society of America Annual Meeting, Indianapolis, IN, November 2018.

Schütte, U.M.E., Henning, J.A., Ye, Y., Bowling, A., Ford, J., Turetsky, M., Waldrop, M., White, J.R., and Bever, J.D., “Effect of permafrost thaw on plant and soil fungal community in the boreal forest: Does fungal community change mediate plant productivity response?,” American Society for Microbiology Branch Meeting, Anchorage, AK, October 2017.

White, J.R., “The effect of warm summer 2012 on seasonal and annual methane dynamics in adjacent small lakes on the ice-free margin of Greenland,” American Geophysical Union Annual Meeting, December 2015.

Thompson, H., Stern, J., Graham, H., Pratt, L., and White, J.R., “Flux chamber measurements of methane emissions and stable isotope composition from an Arctic wetland using field-deployed real-time CRDS vs lab measurements,” American Geophysical Union Annual Meeting, December 2014.

Cadieux, S. B., Schütte, U., White, J. R., Young, S. A., Pratt, L. M., “Phototrophic purple sulfur bacteria in a dimictic Arctic lake under ice cover,” Midwestern Geobiology Meeting, Chicago IL, September 2014.

Goldman, A. E., Cadieux, S. B., White, J. R., Pratt, L. M., “High-resolution passive sampling in Arctic lakes allows detailed analysis of dissolved methane concentration and isotopic composition,” Joint Aquatic Sciences Meeting, May 2014.

White, J.R., Cadieux, S.B., Schütte, U., Young, S.A., Peng, Y., Pratt, L.M., “Phototrophic purple sulfur bacteria in a dilute dimictic arctic lake under ice cover,” Joint Aquatic Sciences Meeting, May 2014.

Cadieux, S.B., Goldman, A. E., White, J.R., Young, S.A., Peng, Y., Pratt, L.M., “Seasonal and spatial variations in cycling of dissolved methane from small Greenlandic lakes: Implications for emissions,” Joint Aquatic Sciences Meeting, May 2014.

Colcord, D. E., Cadieux, S. B., Brassell, S. C., Castañeda, I. S., Pratt, L. M., White, J. R., “Assessment of GDGTs as paleotemperature proxies in a series of lacustrine sediments from southwestern Greenland. GDGT-Based Proxies Workshop: State of the Art and Future Directions, Texel, the Netherlands, April 2014.

Cadieux, S. B., Goldman, A. E., Young, S. E., Peng, Y., Pratt, L. M., White, J. R., “Methane dynamics and microbial communities in small, seasonally ice-covered Arctic lakes in western Greenland: insights into early pluvial periods.” Lunar and Planetary Science Conference, The Woodlands TX, March 2014.

Young, S.A., Cadieux, S.B., Peng, Y., Pratt, L.M., White, J.R., “Sulfur cycling within a small arctic lake in western Greenland: potential insights into early pluvial periods on Mars, Geological Society of America Conference, 2014.

Chen, Y., Tang, Y., Lehmann, K. K., Lacrampe-Couloume, G., Sherwood-Lollar, B., Mahaffy, P., White, J.R., Cadieux, S. B., Goldman, A.E., Pratt, L.M., Onstott, T.C. “Analyzing the $\delta^2\text{H}$ of atmospheric CH_4 in the field with a NIR-CRDS coupled to a cryogenic pre-concentrator,” American Geophysical Union Annual Meeting, December 2013.

Cadieux, S.B., Schütte, U., White, J.R., Young, S.A., Pratt, L.M., “Carbon and hydrogen isotopic systematics of dissolved methane in small seasonally ice-covered lakes near the margin of the Greenland ice sheet,” American Geophysical Union Annual Meeting, December 2013.

Goldman, A. E., Cadieux, S. B., White, J. R., Pratt, L. M., “High-resolution passive sampling of methane in the water column of lakes in Greenland,” American Geophysical Union Annual Meeting, December 2013.

Peng, Y., Pratt, L.M., Young, S.A., Cadieux, S.B., and J.R. White. “The origin of jarosite associated with a gossan on Archean gneiss in Southwest Greenland,” American Geophysical Union Annual Meeting, December 2013.

Colcord, D.E., Cadieux, S.B., Brassell, S.C., Castañeda, I.S., Pratt, L.M., White, J.R. “Assessment of GDGTs as paleotemperature proxies in a series of lacustrine sediments from southwestern Greenland,” American Geophysical Union Annual Meeting, December 2013.

Chen, Y., Tang, Y., Lehmann, K.K., Lacrampe Couloume, G., Sherwood Lollar, B., Mahaffy, P.R., White, J.R., Cadieux, S.B., Goldman, A.E., Pratt, L.M., Onstott, T.C., “Analyzing the $\delta^2\text{H}$ of atmospheric CH_4 in the field with a NIR-CRDS coupled to a cryogenic pre-concentrator.” American Geophysical Union Annual Meeting, December 2013.

Young, S.A., Cadieux, S.B., Peng, Y., Pratt, L.M., White, J.R., “Sulfur cycling within a small arctic lake in Western Greenland: Potential insights into early pluvial periods on Mars.” Geological Society of America Conference, 2013.

Cadieux, S. B., Young, S. A., White, J. R., Peng, Y., Pratt, L. M., “Isotopic evidence for anaerobic oxidation of methane in a small, ice covered arctic lake,” Midwestern Geobiology Symposium, 2013.

Goldman, A. E., Cadieux, S. B., White, J.R., Pratt, L. M., “Passive sampling of dissolved methane through the water column in a Greenlandic lake: understanding lacustrine methane dynamics at half-meter scales” Midwestern Geobiology Symposium, 2013.

Pratt, L. M., Peng, Y., Cadieux, S. B., Young, S. A., and J.R. White. “Small lakes at the ice-free margin of western Greenland as Mars analogs to evaluate methane dynamics,” Lunar and Planetary Institute, Co. 1738, p 4025, August, 2013.

Cadieux, S. B., Pratt, L. M., and J.R. White. “Methane cycling in small, thermokarst lakes in Southwestern Greenland as an analog for Early, Wet Mars,” Lunar and Planetary Science Conference, The Woodlands, Texas, March, 2013.

White, J.R., Webster, K.D., and L.M. Pratt. "Methane Concentration Gradients Associated with Small, Thermokarst Lake on the Ice-Free Margin of Western Greenland," Lunar and Planetary Science Conference, The Woodlands, Texas, March, 2013.

Cadieux, S.B., J.R. White, L.M. Pratt, Peng, Y. and S.A. Young. "Carbon and hydrogen isotopic systematics of dissolved methane in small seasonally ice-covered lakes near the margin of the Greenland ice sheet," American Geophysical Union Annual Meeting, San Francisco, December, B33K-0614, 2013.

Cadieux, S.B., J.R. White, L.M. Pratt, and S.A. Young. "Marked variation in aqueous chemistry, and methane concentrations in small thermokarst lakes in western Greenland," American Geophysical Union Annual Meeting, San Francisco, December, 2012.

Webster, K.D., J.R. White, S. Young, and L.M. Pratt. "Methane gradients associated with a small, deep lake on the ice-free margin of western Greenland," American Geophysical Union Annual Meeting, San Francisco, December, 2012.

Cadieux, S.B., J.R. White, L.M. Pratt, and S.A. Young. "Marked variation in aqueous chemistry, methane concentrations, and sulfur cycling in small thermokarst lakes in western Greenland," Midwest Geobiology Symposium, St. Louis, September, 2012.

Cadieux, S.B., J.A. Rebholz, S.A. Young, L.M. Pratt, and J.R. White. "Sulfur Cycling in small Greenland Lakes as an Analog for Cold, Icy, Planetary Bodies," Astrobiology Graduate Conference, Los Angeles, August, 2012.

Zacny, K., J.R. White, and L.M. Pratt. "Shallow-Borehole Array For Measuring Greenland Emission of Trace Gases as an Analogue for Methane on Mars (GETGAMM)," Concepts and Approaches for Mars Exploration, Lunar and Planetary Institute, Houston, Texas, June, 2012.

Webster, K.D., J.A. Rebholz, J.R. White, B.J. Douglas, and L.M. Pratt. "Using Open-Path Laser Measurement of Atmospheric Methane Concentration Along a Major Shear Zone in Western Greenland as an Analogue for Exploration on Mars," 43rd Lunar and Planetary Science Conference, The Woodlands, Texas, March, 2012.

Bridgham, S.D., Pastor, J., Weltzin, J.F., White, J.R., Shannon, R.D., Dewey, B. and Keller, J.K. "The Long-term Response of Peatlands to Experimental Warming and Water Table Manipulation," Ecological Society of America, Annual Meeting, Albuquerque, New Mexico, August, 2009.

Bridgham, S.D., Pastor, J., White, J.R., Weltzin, J.F., Shannon, R.D. "An Experimental Test of Nine Climate Change Scenarios on Trace Gas and Carbon Dynamics in a Minnesota Bog and Fen Over Eight Years," Soil Science Society of America, 2008.

Tang, J., Zhuang, Q., White, J.R., Shannon, R.D. "Assessing the role of different wetland methane emission pathways with a biogeochemistry model," *Eos Trans. AGU*, 89, Fall Meet. Suppl., Abstract B B33B-0424, 2008.

White, J.R., Shannon, R.D., Bridgham, S.D. Weltzin, J.F., and Pastor, J. "Effects of Soil Warming and Drying on Methane Cycling in Northern Peatlands." *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract B53A-0926, 2007.

Bridgham, S.D., Keller, J., and White, J.R. "The Net Effects of Perturbed Temperature and Water Table Depth on Radiative Forcing in Northern Peatlands." INTECOL VII International Wetlands Conference, Utrecht, Netherlands, July, 2004.

White, J.R., Shannon, R.D., Bridgham, S.D. and Pastor, J. "Effects of Climate Change and Plant Community Composition on Methane Cycling in Boreal Peatlands," INTECOL VI International Wetland Conference, Québec City, August 2000.

Berryman, A.M., Krull, E.S., Elswick, E.R. and White, J.R. "Down Profile Distribution of Major Cations, Anions, and $\delta^{34}\text{S}$ in a Michigan Peat Bog and Implications for Methane Cycling in Peatlands," Geological Society of America Regional Meeting, Indianapolis, IN, April 2000.

Krull, E.S. and White, J.R. "Organic Geochemical Characterization of Recent Decomposition in a Michigan Peat Bog," Quaternary Studies Meeting, Australian National University, February 2000.

White, J.R., Shannon, R.D. and Avery, B. "Isotopic Evidence of Seasonal Changes in the Pathway of Methane Formation in Peatlands," International Association of Theoretical and Applied Limnology (SIL), Dublin, Ireland, August 1998.

White, J.R., Shannon, R.D. and Avery, B. "Isotopic Evidence of Seasonal Changes in the Pathway of Methane Formation in Peatlands," Annual Meeting of the American Society of Limnology and Oceanography, Santa Fe, New Mexico, February 1997.

White, J.R. and Shannon, R.D. "Temporal and Spatial Variations in DOC and Acid-Base Chemistry in Peatland Porewaters," Annual Meeting of the American Society of Limnology and Oceanography, Reno, Nevada, June 1995.

White, J.R. and Shannon, R.D. "Spatial and Temporal Variations in Organic Carbon Substrates Regulating Methanogenesis in Two Michigan Peatlands," Joint Meeting of the American Society for Limnology and Oceanography and of the Society of Wetland Scientists, Edmonton, Alberta, Canada, June 1993.

Shannon, R.D. and White, J.R. "Mechanisms Controlling Methane Emissions in Two Michigan Peatlands," Joint Meeting of the American Society for Limnology and Oceanography and of the Society of Wetland Scientists, Edmonton, Alberta, Canada, June 1993

White, J.R. and Shannon, R.D. "Methane Biogeochemistry in Two Michigan Peatlands," accepted for the Annual Meeting of the American Society for Limnology and Oceanography, Santa Fe, NM, February 1992.

White, J.R. and Shannon, R.D. "Temporal and Spatial Variability in the Cycling of Methane in Two Michigan Peatlands," 1st Annual Conference on Methane in the Atmosphere, National Institute for Global Environmental Change, Huntington Beach, CA, January 1992.

Shannon, R.D., and White, J.R., "Spatial and Temporal Variations in Methane Cycling in Bog Ecosystems," American Chemical Society International Symposium on Environmental Chemistry of Lakes and Reservoirs, April 1991.

Shannon, R.D., and White, J.R., "Methane Cycling in Two Michigan Peat Bogs" Symposium on Biogeochemistry of Wetlands, at the Laboratory for Wetland Soils and Sediments, Louisiana State University, February 1991.

Gilmour, B., and White, J.R., "The Role of Emergent Plants in the Cycling of Methane in Bog Ecosystems," the Midwest Environmental Chemistry Workshop, Gray Freshwater Biological Institute, October 1991.

Shannon, R.D., and White, J.R., "Temporal and Spatial Variability in the Cycling of Methane in Bog Ecosystems," the Midwest Environmental Chemistry Workshop, Gray Freshwater Biological Institute, October 1991.

Shannon, R.D., and White, J.R., "The Selectivity of a Sequential Extraction Procedure for Iron Oxyhydroxide and Sulfides in Freshwater Sediments," the Midwest Environmental Chemistry Workshop, University of Illinois, October 1990.

White, J.R., "Chemical Speciation as a Means of Identifying Artifacts in the Sediment Record of Trace Metals," International Conference on Trace Metals in Lakes, McMaster University, Hamilton, Ontario (August, 1988), pp. 79.

White, J.R., and Gubala, C.P., "The Importance of DOC and Oxide Cycling to the Fate and Transport of Trace Metals in Acidic Lakes," *in* Heavy Metals in the Environment, Lindberg, S.E. and Hutchinson, T.C., Eds. CEP Consultants, Edinburgh, UK, New Orleans (September, 1987), pp. 70.

Gubala, C.P., and White, J.R., "Spatial Variations of Fe and Mn Oxides in the Sediments of an Acidic Lake," *in* Heavy Metals in the Environment, Lindberg, S.E. and Hutchinson, T.C., Eds. CEP Consultants, Edinburgh, UK, New Orleans (September, 1987), pp. 194-196.

White, J.R., and Gubala, C.P., "Trace Metal Biogeochemical Cycling in Acidic Lakes: Processes at the Sediment/Water Interface," 70th Canadian Chemical Conference, Laval University, Quebec City, Canada (June, 1987).

Gubala, C.P., and White, J.R., "A Comparison of Iron and Aluminum Speciation from Atmospheric and Nitrogen Extruded Lake Sediments," 70th Canadian Chemical Conference, Laval University, Quebec City, Canada (June, 1987).

White, J.R., and Gubala, C.P., "The Role of Particle/Solution Chemistry in the Cycling of Lead in Acidic Lake Systems," American Chemical Society Abstracts, 8th Rocky Mountain Regional Meeting, Denver, Colorado (June, 1986).

Gubala, C.P., and White, J.R., "Processes at the Sediment/Water Interface and Their Significance in Trace Metal Chemistry of an Acidic Lake," American Chemical Society Abstracts, 8th Rocky Mountain Regional Meeting, Denver, Colorado (June, 1986).

Ford, J., and White, J.R., "Fractionated Sediment Chemistry as a Tool in Assessing Recent and Postglacial Acidification of Lakes and Upland Soils," American Quaternary Association, University of Illinois (June, 1986).

White, J.R., Driscoll, C.T., and Schafran, G.C., "Lead Cycling in an Acidic Adirondack Lake: Implications for Aquatic Biota," Symposium on Impacts of Acid Rain and Deposition on Aquatic Biological Systems, American Society for Testing and Materials, Philadelphia, 1985.

White, J.R., Schafran, G.C., and Driscoll, C.T., "The Response of Acidic Surface Waters to Strong-Base Addition," Proceedings of the Indiana Water Resources Association, June 1984, pp. 218-232.

White, J.R., Schafran, G.C., and Driscoll, C.T., "Lead Cycling in an Acidic Adirondack Lake," Proceedings from the 2nd New York State Symposium on Atmospheric Deposition, Albany, New York (October, 1983).

White, J.R., Schafran, G.C., Rendall, J.D., and Driscoll, C.T., "CaCO₃ Neutralization of Acidified Surface Waters," National Conference on Environmental Engineering, American Chemical Society, July 1981, pp. 681-688.

Final Reports, Monographs (5)

White, J.R., "A Survey of Trace Metal Chemistry in Phase II Lakes of the National Lake Survey," Technical Report, Electric Power Research Institute, 1988.

White, J.R., "Sequential Chemical Extraction for Aluminum, Iron, and Trace Metal Content," Paleocological Investigation of Recent Lake Acidification: Methods and Project Description, D.F. Charles and D.R. Whitehead, Eds, Interim Report, EPRI, November, 1986.

Dunning, J.D., White, J.R., and Randolph, J.C., "Development and Technological Assessment of Electrophoretic Technique for Reduction of Sulphur Content in Indiana Coal," Final Report, Corporation for Science and Technology, October, 1985.

Jones, W.W., MacDonald, A., White, J.R., Wilder, M.G., Willard, D.E., Ross, J.M., Rillo, T.J., and Robb, G., "Griffy Lake Long-Range Use and Management Plan," Final Report Prepared for Board of Parks and Recreation, Bloomington, IN. August 1984.

White, J.R. 1984. Trace Metal Cycling in a Dilute Acidic Lake System. Ph.D. Thesis, Syracuse University, Syracuse, NY.

Invited Scholarly Addresses

"Exploring the Inner Workings of Greenhouse Gases in Arctic Landscapes under Rapidly Warming Climate," Institute of Ecology and Evolution, University of Oregon, November 2018.

"Exploring the Inner Workings of Greenhouse Gases in Arctic Landscapes under Rapidly Warming Climate," Indiana University Distinguished Faculty Research Lecture, Bloomington, IN, April 2018.

"Innovative Studies of Methane Biogeochemistry at the Edge of the Greenland Ice Sheet," Institute of Ecology and Evolution, University of Oregon, May 2015.

"Evaluating Methane Dynamics in Lakes, Wetlands and Soils at the Edge of the Greenland Ice Sheet as Mars Analogues," Marine Sciences Program Seminar Series, University of North Carolina Chapel Hill, NC, October 2013.

"Greenhouse Gases and Climate Feedbacks in Arctic Landscapes: A Key Unknown in Global Warming," Reunion Lecture Series, Gettysburg College, PA, June 2012.

"Climate Feedbacks and Greenhouse Gas Emissions in Northern Peatlands: Meltdown of the Great White North," Earth Day Lecture, Lawrence University, Appleton, WI, April 2009.

“Effects of Soil Warming and Drying on Methane Cycling in Northern Peatlands,” Fall Meeting, American Geophysical Union, San Francisco, December 2007.

“Effects of Soil Warming and Drying on Methane Cycling in Northern Peatlands,” Earth and Atmospheric Science Seminar Series, Purdue University, November 2007.

“Potential Effects of Climate Forcing on Methane Cycling in Northern Peatlands: Stable Isotopic Evidence from Mesocosms and Natural Sites,” Seventh Symposium on Biogeochemistry of Wetlands, Duke University, June 2001.

“Feedbacks Between Climate Change and Terminal Carbon Metabolism in Northern Peatland Ecosystems,” Department of Geography Colloquium Series, Indiana University, Bloomington, November 2000.

“Effects of Climate Change and Plant Community Composition on Methane Cycling in Boreal Peatlands,” INTECOL VI International Wetland Conference, Québec City, August 2000 (Keynote Address).

“Isotopic Evidence of Seasonal Changes in the Pathway of Methane Formation in Peatlands,” International Association of Theoretical and Applied Limnology (SIL), Dublin, Ireland, August 1998.

“Biogeochemical Cycling of Methane in Peatland Soils: Isotopic Evidence,” Department of Geological Sciences Colloquium, Indiana University, Bloomington, September 1997.

“Biogeochemistry of Methane in Peatland Soils: Isotopic Evidence,” Department of Geology Colloquium, Indiana University - Purdue University, Indianapolis, November, 1996.

“Greenhouse Gases in Peatland Ecosystems: Biotic Controls,” Seminar Series in Biological Sciences, University of Louisville, November 1994.

“The Cycling of Methane and Methanogenic Substrates in Peatland Ecosystems of the Northern Temperate Zone,” Seminar Series in Marine and Earth Sciences, University of North Carolina, March, 1994.

“Temporal and Spatial Controls on Methane Emissions from Peatland Ecosystems,” Oak Ridge Conference on Global Environmental Change, March 1994.

“Biogeochemical processes controlling the cycling of methane and organic acids in peatland soils,” Department of Soil Sciences and Geology, Wageningen Agricultural University of the Netherlands, and the Royal Netherlands Academy of Arts and Sciences Institute of Ecology, Wageningen and Nieuwersluis, the Netherlands, October 1993.

“Biogeochemical Cycling of Iron and Sulfur in Acidic Lakes Systems,” Research Colloquium Series, Department of Geology, Indiana University, January 1990.

“Chemical Speciation as a Means of Identifying Artifacts in the Sediment Record of Trace Metals,” International Conference on Trace Metals in Lakes, National Water Research Institute, Burlington, Ontario, Canada, August, 1988.

“Trace Metal Biogeochemical Cycling in Acidic Lakes: Processes at the Sediment/Water Interface,” Canadian Chemical Conference, Symposium on Trace Metal Speciation, Laval University, Quebec City, Canada, June, 1987.

“Trace Metal Transport and Deposition in Lake Sediments: The Role of DOC and Iron Oxides,” Marine Biological Laboratory Seminar Series, Woods Hole Oceanographic Institute, October 1986.

“In-Lake Processes Affecting the Cycling of Trace Metals in Dilute Acidic Systems,” Invited Lecture, Department of Botany, University of Toronto, October 1986.

“Trace Metal Chemistry and Transport in Acidic Lakes: The Role of Sediment/Water Interfaces,” Institute for Environmental Studies, Acid Precipitation Lecture Series, University of Toronto, October 1986.

“An Analysis of Aluminum Chemistry in Lakes of the Eastern United States,” Exploratory Analysis Workshop, U.S. EPA, Tucson, Arizona, February, 1986.

“Manganese Cycling in an Acidic Adirondack Lake,” Regionalization of Integrated Lake Watershed Acidification Study (RILWAS) Meeting, Colgate University, NY, May, 1985.

“Sequential Chemical Extraction of Lake Sediments to Determine Metal Speciation,” Indiana University Research Expo `85, Acid Precipitation Session, April 1985.

“Chemical Neutralization of Acid Lakes: Technical Certainties and Uncertainties.” Indiana Energy Symposium, Purdue University, IN, October 3-4, 1983.

RECENT RESEARCH GRANTS

“An Evaluation of the Effects of Stream Restoration on the Benthic and Hyporheic Environments of the Fawn River, IN,” Fawn River Restoration and Conservation Charitable Trust, Nov 2011-Dec 2015, \$164,000; Principal Investigators, Jeffrey R. White, Todd V. Royer, Indiana University.

“Shallow-Borehole Array for Measuring Greenland Emissions of Trace Gases as an Analogue for Methane on Mars,” NASA Astrobiology, May 2011-May 2016, \$2,400,000; Principal Investigator, Lisa Pratt; Co-Principal Investigators, Jeffrey R. White, Indiana University, Alexander Pavlov & Paul Mahaffy, NASA Goddard Space Flight Center, Kris Zacny, Honeybee Robotics Ltd., Lance Christensen, Jet Propulsion Laboratory, Tullis Onstott, Princeton University.

“An Assessment of Biogenic Nitrous Acid Production in Soil Using Fluorescence In-Situ Hybridization (FISH) and Cavity-Enhanced Absorption Spectroscopy (CEAS),” FRSP, Indiana University, Sept 2011-Aug 2015, \$127,000; Principal Investigators, Jonathan D. Raff & Jeffrey R. White, Indiana University.

“Using Metagenomics and Traditional Ecological Approaches to Assess the Effects of Mycorrhizal Fungal Community Dynamics on Plant Productivity in Warming Boreal Peatlands in Alaska,” Indiana University, Jan 2011-Dec 2015, \$78,314; Principal Investigator, Jim Bever; Co-Principal Investigators, Jeffrey R. White, Ursel Schütte, Haixu Tang, Indiana University.

“Quantitative Characterization of Bacterial Communities Regulating Acid Neutralization in an AMD Bioreactor at the Blackfoot Reclamation Site,” Indiana Department of Natural Resources, July 2011-Dec 2015, \$102,000; Principal Investigator, Jeffrey R. White, Co-Principal Investigator, Ursel Schütte.

PAST RESEARCH GRANTS

“Establishment of Sycamore Creek as a CRES Watershed Research Area,” Indiana University, Jan 2009-June 2013, \$36,635; Principal Investigator, Jeffrey R. White; Co-Principal Investigators, Todd V. Royer, Flynn W. Picardal, Indiana University.

“Effects of Accelerated Sea Level Rise and Variable Freshwater River Discharge on Ecosystem Services of Freshwater Tidal Floodplain Forests,” Department of Energy, Jan 2008-Dec 2011, \$343,000; Principal Investigator, Christopher Craft, Co-Principal Investigators: Jeffrey White, Craig Wayson, Indiana University.

“Ecosystem-Atmosphere Exchange of Carbon, Water and Energy Over a Mixed Deciduous Forest in the Midwest.” Department of Energy, September 2008-August 2011, \$631,000; Principal Investigator, Hans Peter Schmid; Co-Principal Investigators: Danilo Dragoni, Sue Grimmond, J.C. Randolph, Jeffrey White, Indiana University.

“Acquisition of an Isotope Ratio Monitoring Mass Spectrometer for H, O, C, and N in Waters, Hydrous Minerals, Carbonates, and Organic Materials, and an Accelerated Solvent Extractor.” National Science Foundation, May 2003-April 2004, \$195,000; Principal Investigator, Arndt Schimmelmann; Co-Principal Investigators: Peter Sauer, Jeffrey White, Lisa Pratt, Edward Ripley, Indiana University.

“Effects of Climate Change and Plant Community Composition on Methane Cycling in Peatlands,” National Science Foundation, June 1998- May 2002, \$275,000; Co-principal Investigator, Robert D. Shannon, Penn State University.

“An Investigation of the Physical and Biogeochemical Processes Controlling Methane Emissions From Peatland Ecosystems,” National Institute for Global Environmental Change, U.S. Department of Energy, Midwestern Regional Center, Indiana University, July 1993-June 1994, \$65,000; Co-principal Investigator, Robert D. Shannon, Indiana University.

“An Integrated Analysis of Amazonian Deforestation and Succession and Their Role in the Global Carbon Cycle,” National Science Foundation, July 1993-June 1996, \$501,378; Principal Investigator, J.C. Randolph; Co-principal Investigators: Emilio Moran, Jeffrey White, and Jae Lee, Indiana University.

“Temporal and Spatial Variability of Methane Cycling in Wetland Ecosystems of the Northern Temperate Zone,” National Institute for Global Environmental Change, U.S. Department of Energy, Midwestern Regional Center, Indiana University, July 1992-June 1993, \$149,000; Co-principal Investigator, Robert D. Shannon, Indiana University.

“The Influence of Climatic Change on the Long-term Hydrological and Biogeochemical Trajectories of North American Watershed-Lake Ecosystems,” National Institute for Global Environmental Change, U.S. Department of Energy, Midwestern Regional Center, Indiana University, July 1992-June 1993, \$137,000; Co-principal investigators: Donald R. Whitehead and P. Roger Sweets, Indiana University.

“Temporal and Spatial Variability of Methane Cycling in Wetland Ecosystems of the Northern Temperate Zone,” National Institute for Global Environmental Change, U.S. Department of Energy, Midwestern Regional Center, Indiana University, July 1991-June 1992, \$156,000.

“The Influence of Climatic Change on the Long-term Hydrological and Biogeochemical Trajectories of North American Watershed-Lake Ecosystems,” National Institute for Global Environmental Change, U.S. Department of Energy, Midwestern Regional Center, Indiana University, July 1991-June 1992, \$129,000, Co-principal investigators: Donald R. Whitehead and P. Roger Sweets, Indiana University.

“Temporal and Spatial Variability in Methane Emissions From Wetland Ecosystems in the Northern Temperate Zone,” National Institute for Global Environmental Change, U.S. Department of Energy, Midwestern Regional Center, Indiana University, August 1990-July 1991, \$110,500.

“The Influence of Climatic Change on The Long-Term Hydrological and Biogeochemical Trajectories of North American Watershed-Lake Ecosystems,” National Institute for Global Environmental Change, U.S. Department of Energy, Midwestern Regional Center, Indiana University, August 1990-July 1991, \$122,900, Co-principal investigators: Donald R. Whitehead and P. Roger Sweets, Indiana University.

“An Evaluation of Stable Nitrogen Isotopes as a Tool for Determining Sources of Ammonia and Nitrate in Surface Waters,” Water Resources Research Center, United States Geological Survey via Purdue University, July 1990-June 1991, \$75,000.

“Spatial and Temporal Variations in Trace Metal Concentrations in the White River,” City Plating Co. of Indianapolis, September 1990-August 1991, \$12,000.

Indiana University Outstanding Young Faculty Award, “Spatial Variations in Sediment Biogeochemistry of an Acidic Lake”, June 1987-May 1989, \$10,500.

School of Public and Environmental Affairs Summer Faculty Fellowship, “Spatial Variations in Sediment Biogeochemistry of an Acidic Lake”, 1987, \$4,500, declined in lieu of above award.

“Examination of Drinking Water Quality at Indiana Schools Served by Non-Community Water Supplies,” U.S. Environmental Protection Agency; September 1988-December 1989, \$180,000. Project Manager: William W. Jones.

“A Survey of Trace Metal Chemistry in Phase II Lakes of the National Lake Survey,” U.S. Environmental Protection Agency and the Electric Power Research Institute (EPRI); May 1986-September 1989, \$70,000.

“Trace Metal Speciation and Geochemistry of Lake Sediments, Paleoecological Investigation of Recent Lake Acidification (PIRLA) Project,” Electric Power Research Institute (EPRI); January 1984-December 1986, \$18,300.

“An Analysis of Metal Chemistry Data from Phase I of the National Lake Survey,” U.S. Environmental Protection Agency; August 1985-January 1986, \$10,000.

“Development and Technological Assessment of an Electrophoretic Technique for Reduction of Sulphur Content in Indiana Coal,” Indiana Corporation for Science and Technology; August 1984-August 1985, \$156,109. Co-Principal Investigators: Jeremy D. Dunning and J.C. Randolph, Indiana University.