

CURRICULUM VITA
G. PHILIP ROBERTSON

University Distinguished Professor
Dept. of Plant, Soil, and Microbial Sciences and
W. K. Kellogg Biological Station
Michigan State University
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Education

1976 B. A. Hampshire College, Amherst, Massachusetts
1980 Ph.D. Biology (Ecology & Evolutionary Biology), Indiana University (advisor P.M. Vitousek)

Professional Experience

1985-now Assistant, Associate, Professor, and University Distinguished Professor, Dept. of Plant, Soil, and Microbial Sciences and W.K. Kellogg Biological Station, Michigan State University
1981-1985 Postdoctoral Research Associate, Dept. of Crop and Soil Sciences and Dept. of Microbiology and Public Health, Michigan State University (advisor J.M. Tiedje)
1980-1981 SCOPE-Mellon Postdoctoral Fellow, UNEP International Nitrogen Unit, Royal Swedish Academy of Sciences, Stockholm (advisor T. Rosswall)

Primary Grant Support (past 10 years)

current NSF (Division of Environmental Biology): Long Term Ecological Research in Field Crop Ecosystems; PI with co-PIs S.K. Hamilton, K.L. Gross, D.A. Landis, T.M. Schmidt, S. Snapp, S.M. Swinton; \$5.9M; (2010-2016).
current DOE Office of Science (Biological and Environmental Sciences Division): Great Lakes Bioenergy Research Center; co-PI with T. Donohue (PI), K. Keegstra, B. Dale, J. Ralph, R. Landick; and ~50 co-I's; \$250M (2008-2017) [Research Leader for Sustainability].
current NSF (Coupled Natural-Human Systems): A Social-Ecological Analysis of Nitrogen in Agricultural Systems of the Upper Midwest; co-PI with D. Stuart (PI), D. Basso, S.T. Marquart-Pyatt, J. Zhao; \$1.5M (2013-2017).
current NSF (EAGER) Development of a New Technique to Measure Ecosystem-level Soil Nitrous Oxide Fluxes using Micrometeorological Towers; co-PI with postdoc I. Gelfand (PI), M. Zondlo (Princeton); \$150,000 (8/2014-7/2016).
2010-2015 NSF (EHR Graduate Education Division); GK-12 Pre-doctoral Fellowship Program: Biofuel Sustainability in K12 Classrooms of Rural Michigan; co- PI, with T. Getty (PI), C.W. Anderson, J. Lau, and K, Gross; \$2.7M.
2011-2015 USDA (AFRI Organic Transitions Program): Cover Crops and N₂O Emissions, N Availability and Carbon Accumulation in Organic versus Conventionally Managed Systems; co-PI with PI D. Mutch; \$749,000.
2014-2015 USDA NIFA (SARE): Linking soil testing with farmer decision making – an interdisciplinary approach; co-PI with PhD student B. O'Neill; \$6,853
2014-2015 USDA NIFA (SARE): Assessing soil carbon pools across rotational and diversified cropping systems in experimental plots and on-farm ; co-PI with PhD student C. Sprunger; \$6,382
2006-2013 EPRI (Electric Power Research Institute): Developing greenhouse gas emission offsets by reducing nitrous oxide emissions in agricultural crop production ; PI with R. Gehl, P. Grace; \$1.2M.

- 2011-2013 NSF (Division of Environmental Biology): Dissertation Research: Denitrification in subsurface soils; co-PI with graduate student I. Shcherbak; \$9,832.
- 2004-2010 NSF (Division of Environmental Biology): Long Term Ecological Research in field crop ecosystems; PI with S.H. Gage, K.L. Gross, S.K. Hamilton, D.A. Landis, T.M. Schmidt, S.M. Swinton; \$5.1M.
- 2005-2009 NSF (Social, Behavioral, and Economic Sciences): Ecosystem services from low-input cropping systems; co-PI with S.M. Swinton (PI), F. Lupi; \$400,000.
- 2006-2009 NSF (EHR Graduate Education Division): GK-12 Pre-doctoral Fellowship Program: Ecological literacy in the K-12 classrooms of rural Michigan; PI, with T. Getty, A. Anderson, J. Conner, G. Mittelbach; \$1.6M.
- 2006-2009 NSF (Division Biological Infrastructure Program): A field-based science and education facility at the Kellogg Biological Station; PI with K.L. Gross; \$249,500.
- 2006-2008 USDA-CSREES (MSU Sustainable Agriculture Award); Ecosystem services and economic benefits of reduced input agricultural systems; PI with PhD student S. Parr; \$50,000.
- 2006-2007 NSF (Division of Environmental Biology): Doctoral Dissertation Research: Soil resource aggregation and ecosystem function; PI with PhD Student T. Loecke; \$9,945.

Professional Affiliations and Awards

Fellow, AAAS (elected 2015)

Fellow, Soil Science Society of America (elected 2003)

Member of AAAS, AIBS, Soil Science Society of America, American Geophysical Union, Ecological Society of America

Professional Service (last 10 years)

current DOE Office of Science Biological and Environmental Research Advisory Committee (BERAC) (since 2010)

current NSF Long-Term Ecological Research Science Council (since 1988)

current Science Advisory Board, Regional Approaches to Climate Change for Pacific Northwest Agriculture (USDA Wheat Climate Change Center) (since 2011)

current U.S. National Climate Assessment Agricultural Indicators Team (since 2013)

current Research Committee, USDA Long-term Agricultural Research Network (since 2014)

current Scientific Advisory Board, ECOSERV, INRA, Paris (since 2016)

2016 DOE ARPA-E Competitive Grants Panel (ROOTS)

2015 Co-organizer, USDA LTAR Common Experiment Workshop, Minneapolis MN

2012-2015 NSF DEB Ecosystems Panel (2012, 2013, 2014, 2015)

2014-2015 Scientific Program Committee for the 2015 Climate Change and Cereal Production Symposium, Minneapolis MN

2014 Committee of Visitors, NSF Biology Directorate

2014 Chair, US LTER Network Chair Nominating Committee

2013 Review editor, U.S. National Climate Assessment

2011-2014 Lead Author, US National Climate Assessment (Midwest Chapter)

2011-2014 USDA ERS Workgroup on Quantifying GHG Emissions from Agriculture

2013-2014 Chair, Organizing Committee and Writing Team, DOE Bioenergy Sustainability Workshop

2011-2013 Climate Action Reserve Science Advisory Board

2011-2012 Advisory Committee, Walmart Jack-n-Coke Sustainability Project

2009-2012 NEON Domain Science and Education Coordination Committee

2011 USDA Long-term Agricultural Research Network Review Panel

- 2010-2011 Council on Agricultural Science and Technology (CAST) Task Force on the Role of Agriculture in Greenhouse Gas Fluxes and Carbon Sequestration
- 2007-2011 Chair (elected), NSF Long-term Ecological Research (LTER) Network Science Council and Executive Board
- 2001-2010 Science Committee, Ecological Society of America
- 2005-2012 Scientific Rapid Response Team, Ecological Society of America
- 2000-2009 Advisory Board for Biosphere-Atmosphere IGERT, Univ. Michigan
- 2007 NSF External Site Review Team, Central Arizona Phoenix LTER Site
- 2004-2007 U.S. Carbon Cycle Scientific Steering Group
- 2005-2007 co-Chair, Consortium of Regional Ecological Observatories for NEON (COREO)
- 2005-2007 co-Chair, Great Lakes Ecological Observatory for NEON (GLACEO)
- 2001-2006 Executive Committee, Consortium for Agricultural Soil Mitigation of Greenhouse Gases (CASMGs)

Editorships

- 1984-1989 Editor, *Plant and Soil*
- 1988-1992 Editor, *Ecology and Ecological Monographs*
- 2004-2009 Editor, *Biogeochemistry*
- 2009-2015 Guest Editor, *PNAS*

Invited Symposia/Workshop/Seminar Presentations (last 5 years)

- 2016 JASON Spring Science Meeting, McLean VA

- 2015 IPCC Workshop on Climate Change and Agriculture, Dublin (discussant)
 Temperate Agriculture Research Network Workshop, Paris (discussant)
 North Central Cropping Systems Extension Academy, Michigan
 Agricultural Sustainability Workshop, China Agricultural University, Beijing
 USDA NIFA Science Outcome Series, Washington DC
 USDA Long-term Agricultural Research Design Workshop, Minneapolis (co-organizer)

- 2014 Fate of the Earth Symposium, East Lansing
 Climate Change and Midwest Agriculture Conference, Missouri Botanical Garden, St. Louis
 Brazilian Bioenergy Science and Technology Conference, Sao Paulo Brazil
 American Society of Agronomy Bioenergy Feedstock Symposium, Minneapolis

- 2013 Philip C. Hamm Memorial Lecture, University of Minnesota
 DOE Genome-Sustainability Workshop, Washington, DC (lead organizer)
 MSU Biotechnology Symposium, East Lansing
 Biogeochemistry Program, Cornell (student-invited speaker)
 Dept. of Crop and Soil Sciences, Cornell University
 REEACH Program, Washington State University

- 2012 NSF Long-term Ecological Research Mini-Symposium, Washington, DC
 USDA N2O Cropping Practices Workshop, Ft. Collins, CO (organizer)
 American Society of Agronomy Symposium on Nitrogen and Climate Change, Cincinnati
 SARE North Central Region Climate and Energy Conference, Michigan
 Society for Environmental Journalists Climate Change Workshop, Michigan
 China Agricultural University Workshop on Nitrogen Management, Beijing

Dept. of Plant, Soil, and Microbial Sciences, MSU

- 2011 American Society of Plant Biology Plant Science Summit, Washington, DC
EPRI Greenhouse Gas Emissions Offsets Workshop on Creating Nitrous Oxide (N₂O) Emissions Offsets in U.S. Agriculture, Washington, DC
Soil and Water Conservation Society Conference on Conservation Science and Policy, Washington, DC (with N. Millar)
American Chemical Society Symposium on Nitrogen and the Human Endeavor, Denver (with R. Gehl)
International Nitrogen Initiative Workshop on Nitrogen-Climate Interactions on Terrestrial and Aquatic Ecosystems, Agriculture, and Human Health in the US, Ft. Collins
Ecological Society of America Symposium on the Emergence and Future Role of Long-term Socio-ecological Research for Earth Stewardship, Austin, TX (with S. Collins)
Dept of Physics Soiree, California Polytech, San Luis Obispo
- 2010 AAAS Symposium on Integrated Science for Society and the Environment, San Diego (organizer)
DOE Biological Environmental Research Advisory Committee, Washington, DC
C-AGG Workshop on Trace Gas Emissions from Agriculture, Chicago
Ecological Society of America Symposium on NSF Graduate Education Programs
Soil and Water Conservation Society Symposium on Bioenergy Sustainability (with R. Lowrance, V. Dale)
College of Natural Resources, Washington State University
Program in Environmental Science, University of Idaho
- 2009 National Academy of Sciences Darwin Symposium, Washington, DC
AAAS Symposium on Biofuels: Consequences for Carbon, Landscapes, and Sustainability, Chicago (with C. Izaurrealde)
Global Systems Science Distinguished Speaker Series, NSF, Arlington
Larson and Allmaras Distinguished Lecture Series, Univ. Minnesota
Workshop on Biofuels Sustainability, DOE GTL Conference, Bethesda, MD
International Soil Organic Matter Symposium, Colorado Springs, CO (keynote)
Long-term Ecological Research Network All Scientist Meeting, Estes Park, CO (plenary)
Symposium on Biofuel Landscapes, Entomological Society of America, Indianapolis (keynote)
- 2008 National Conference on Ecological Dimensions of Biofuels Sustainability, Washington, DC (plenary)
Workshop on a Midwest CO₂ Cap and Trade Program, Midwest Governors Association, Detroit
Symposium on New Directions in Agricultural Ecology, Ecological Society of America, Milwaukee
DOE-USDA Workshop on Biofuels Sustainability, Washington, DC (plenary)
- 2007 Symposium on NSF Funding for Education, Ecological Society of America, San Jose, CA
International Long-term Ecological Research Symposium, Beijing (plenary)
Workshop on Frontiers in Sustainability Science, Cary Institute of Ecosystem Studies, NY
- 2006 Symposium on Soil Biophysical and Environmental Controls on Greenhouse Gas Emissions, American Society of Agronomy, Indianapolis (with S. Grandy)
Symposium on Ecological Challenges of Organic Agriculture, Ecological Society of America, Memphis
Workshop on Managing Agricultural Landscapes for Environmental Quality, Soil Water and Conservation Society, Kansas City (plenary)
USDA Workshop on Creating a Long-term Agricultural Research Network, Washington, DC

Presentations to Congressional Committees

- 2014 Briefing for the U.S. Senate on Long-term Ecological Research: Regional Data for Large Scale Environmental Issues (AIBS-sponsored).
- 2008 Briefings for the U.S. House Science and Technology Committee and the U.S. Senate Agriculture, Nutrition, and Forestry Committee on the Sustainability of Cellulosic Biofuels (lead organizer; ESA-sponsored) (described at www.esa.org/pao/policyActivities/briefing062008.php)
- 2005 Briefing for the U.S House Science Committee on Broader Impacts of Long-Term Ecological Research Program (AIBS-sponsored)
- 2003 Briefings for 1) the U.S Senate Agriculture, Nutrition and Forestry Committee and 2) the U.S. House Agriculture Committee on Findings of the NRC Committee to Evaluate the USDA Research, Extension, and Education Activities (Frontiers in Agricultural Research) (NRC-sponsored)
- 2002 Briefing for the U.S. House Agriculture Committee on Greenhouse Gas Mitigation Potentials for US Agriculture (CASMGS-sponsored)
- 2001 Testimony before the U.S. Senate Agriculture, Nutrition, and Forestry Committee on Research, Extension and Education in the Farm Bill for the National Academy of Sciences (available at <http://www4.nas.edu/ocga/testimon.nsf>) (NRC-sponsored)
- 2000 Briefing for the U.S. Senate Agriculture, Nutrition, and Forestry Committee on Carbon Sequestration Potentials in the US (SSSA and ESA sponsored)

Public Presentations (last 5 years)

- 2016 Flint Sierra Club, Flint MI (Ecosystem Services from Agriculture)
Larry Meillor Show, Wisconsin Public Radio (Bioenergy Sustainability)
Sierra Club, Midland MI (Climate Change and Agriculture)
K-12 ICCARS (Investigating Climate Change and Remote Sensing) Series, Wayne County MI
Community Climate Change Discussion, KBS
- 2015 Osher Lifelong Learning Lecture Series, Saginaw MI (Climate Change and Michigan Agriculture)
Our Changing Earth Lecture Series, Midland MI (Climate Change and Michigan Agriculture)
K-12 Partnership Teacher Workshop, KBS (Climate Change and Michigan Agriculture)
- 2014 Michael Patrick Shiels Radio Show (National Climate Assessment)
Stateside with Cynthia Canty on Michigan Public Radio (Climate Change and Agriculture)
Michigan Basin Geologists (Climate Change)
Kalamazoo Interfaith Climate Coalition (Climate Change and Agriculture)
- 2013 MSU Science Festival, East Lansing (Climate Change)

Contributed Papers at National Meetings (last 5 years; >250 published abstracts since 1980)

- 2015 20 total: **American Society of Agronomy**, Minneapolis MN (Millar et al.; Smith et al.); **Ecological Society of America** Baltimore MD (Abraha et al.; Sprunger et al.; Su et al.); **LTER National All Scientist Meeting**, Estes Park CO (Abraha et al.; Gelfand et al.; Glanville et al.; Liang and Robertson; Robertson et al.; Sprunger and Robertson; Su et al.); **American Geophysical Union**, San Francisco CA (Abraha et al.; Gelfand et al.; Hess et al.; Hussain et al.; Tao et al.; Walbridge et al.; Zhang et al.); **Soil Ecological Society**, Colorado Springs CO (Haddix et al.)
- 2014 11 total: **American Society of Agronomy Meeting**, Long Beach CA (Jones et al.; Millar et al. (2); Robertson et al.; Sprunger and Robertson; Thelen et al.); **Ecological Society of America**,

- Sacramento CA (Hess et al.; Iverson et al.; Roley et al.); **American Geophysical Union**, San Francisco CA (Gelfand et al.; Hussain et al.).
- 2013 10 total: **American Society of Agronomy Meeting**, Tampa FL (Kahmark et al.; Millar et al. (2); Ruan et al.; Shcherbak et al.); **Ecological Society of America**, Minneapolis MN (Gelfand et al.); **American Geophysical Union**, San Francisco CA (Abraha et al.; Gelfand et al.; Su et al.); **Energy Utility Environment Conference**, Phoenix AZ (Diamant et al.).
- 2012 17 total: **American Society of Agronomy Meeting**, Cincinnati OH (Millar et al. (2); Ruan & Robertson; Shcherbak & Robertson; Baas et al.; Kahmark et al.); **Ecological Society of America**, Portland OR (Ruan et al.; Gelfand et al.); **ILTER National All Scientist Meeting**, Estes Park CO (Ruan et al.; Kahmark et al.; Millar et al.; Shcherbak et al.; Zenone et al.; Gelfand et al.); **American Geophysical Union**, San Francisco CA (Gelfand et al.; Shcherbak et al; Zenone et al.)
- 2011 20 total: **American Society of Agronomy Meeting**, San Antonio TX (Bhardwaj et al. (5); Grace et al.; Kahmark et al; Millar et al.; Ruan et al.; Sanford et al.; Zenone et al.); **Ecological Society of America**, Austin TX (Robertson et al.; Bhardwaj et al., Collins et al.; Gelfand et al.; Ruan et al.; Zenone et al.); **American Geophysical Union**, San Francisco CA (Gelfand et al.; Shcherbak et al; Zenone et al.)

University Service (last 5 years)

- current Chair, KBS LTER Executive Committee (since 1987)
- current Member, GLBRC Management Team (since 2008)
- current Chair, GLBRC Sustainability Area Leadership Council (since 2008)
- current Member, Provost Promotion and Tenure Advisory Committee (since 2015)
- 2013-2014 Member, Provost Search Committee
- 2012-2013 Chair, Dean Search Committee, College of Agriculture and Natural Resources
- 2009-2011 Member, Ecology, Evolutionary Biology and Behavior Program Steering Committee

Department Service (last 5 years)

- current Member, KBS Faculty Advisory Committee (since 2015)
- current Member, KBS Outreach Committee (since 2015)
- current Member, Kellogg Farm Research Advisory Committee (since 2014)
- current Member, PSM Research Committee (since 2014)
- 2015-2016 Chair, Search Committee for Cropping System Agronomist (PSM)
- 2013-2014 Member, Soil Biology Search Committee (PSM)
- 2012-2013 Chair, PSM Promotion and Tenure Committee
- 2012-2013 Chair, PSM Dept. Advisory Committee
- 2011-2012 Member, CSS Dept. Advisory Committee
- 2011-2012 Co-chair, PSM Promotion and Tenure Committee

Teaching Activities

Courses Taught

- Agricultural Ecology (CSS 412/442): 1989-1990, 2011-2016
- Forest & Agricultural Ecology (CSS/FOR 404): 1992, 1994-2000
- Biogeochemistry (CSS/MPH 426): 1996-2003, 2006-2007
- Soil Biology (CSS 360): 2006-2007
- Also: Geostatistics (CSS 412; 1987); Landscape Ecology (CSS 412; 1988); Root Resource Interactions (EEB 891; 1989); Plant Ecology (BOT 450; 1992); Terrestrial Ecology and Evolution (1993); Ecology (ZOL 250; 1993); Advanced Terrestrial and Aquatic Ecology (1995); Scientific Presentations (CSS 893; 1998); Soil Organic Matter Dynamics (CSS 893; 2004); Biogeochemistry of Sustainable Agriculture

(CSS 893; 2004)

Graduate Students Supervised

Michel Cavigelli (Ph. D., 1998); Timothy Bergsma (Ph.D. 2000); Pongthep Sunwararee (Ph. D. 2003); Stuart Grandy (Ph.D. 2005); Terry Loecke (Ph.D. 2007); Sara Parr Syswerda (PhD. 2009) ; John Hoben (M.Sc. 2009); Iurii Shcherbak (Ph.D. 2013) ; Leilei Ruan (Ph.D. 2014); Christine Sprunger (Ph.D. 2015); Di Liang (Ph.D.; current); Kathryn Glanville (Ph.D.; current)

Postdoctoral Scholars

Katherine M. Klingensmith (1988-1990); Jacqueline Henrot (1989-1991); Keith Paustian (1989-1994); Harold Collins (1994-1996); Per Ambus (1996-1998); Craig Russell (1997-1999); Kevin Kosola (1997-2000); Ann-Marie Fortuna (2001-2002); Tim Parshall (2002-2004); Claire McSwiney (2002-2007); Laurel Hartley (2006-2008); Poonam Jasrotia (2007-2011); Neville Millar (current); Ilya Gelfand (current); Sarah Roley (current)

Publications

1981

Robertson, G.P. and P.M. Vitousek. 1981. Nitrification in the course of ecological succession. *BioScience* 31:141-144.

Robertson, G.P. and P.M. Vitousek. 1981. Nitrification potentials in primary and secondary succession. *Ecology* 62:376-386.

1982

Robertson, G.P. 1982. Factors regulating nitrification in primary and secondary succession. *Ecology* 63:1561-1573.

Robertson, G.P. 1982. Nitrification in forested ecosystems. *Philosophical Transactions of the Royal Society London B* 296:445-457.

Robertson, G.P. 1982. Regional nitrogen budgets: approaches and problems. *Plant & Soil* 67:73-80.

1984

Robertson, G.P. 1984. Nitrification and nitrogen mineralization in a lowland rainforest succession in Costa Rica, Central America. *Oecologia* 61:99-104.

Robertson, G.P. and J.M. Tiedje. 1984. Denitrification and nitrous oxide production in successional and old growth Michigan forests. *Soil Science Society of America Journal* 48:383-389.

1985

Robertson, G.P. and J.M. Tiedje. 1985. An automated method for sampling the contents of stoppered gas collection vials. *Plant and Soil* 83:453-457.

1986

Robertson, G. P. 1986. Nitrogen: Regional contributions to the global cycle. *Environment* 28: 16-21.

Robertson, G.P. and T. Rosswall. 1986. Nitrogen in West Africa: the regional cycle. *Ecological Monographs* 56:43-72.

1987

Matson, P.A., P.M. Vitousek, J.J. Ewel, M.J. Mazzarino and **G.P. Robertson**. 1987. Nitrogen transformations following tropical forest felling and burning on volcanic soil. *Ecology* 68:491-502.

Robertson, G.P., P.M. Vitousek, P.A. Matson and J.M. Tiedje. 1987. Denitrification in a clear-cut Loblolly pine (*Pinus taeda* L.)plantation in the southeastern U.S. *Plant and Soil* 97:119-129.

Robertson, G.P. and J.M. Tiedje. 1987. Nitrous oxide sources in aerobic soils: nitrification, denitrification, and other biological processes. *Soil Biology and Biochemistry* 19:187-193.

Robertson, G.P. 1987. Geostatistics in ecology: interpolating with known variance. *Ecology* 68:744-748.

1988

Robertson, G.P., M.A. Huston, F.C. Evans and J.M. Tiedje. 1988. Spatial variability in a successional plant community: patterns of nitrogen availability. *Ecology* 69:1517-1524.

Robertson, G.P. and J.M. Tiedje. 1988. Deforestation alters denitrification in a lowland tropical rainforest. *Nature* 336:756-759.

Sollins, P., **G.P. Robertson**, and G. Uehara. 1988. Nutrient mobility in variable- and permanent-charge soils. *Biogeochemistry* 6:181-199.

Groffman, P.M., J.M. Tiedje, **G.P. Robertson** and S. Christensen. 1988. Denitrification at different temporal and geographic scales: proximal and distal controls. pp. 174-192. In J.R. Wilson, ed. *Advances in N Cycling in Agricultural Ecosystems*. Comm. Agric. Bur. International, Wallingford, U.K.

1989

Paul, E.A. and **G.P. Robertson**. 1989. Ecology and the agricultural sciences: a false dichotomy? *Ecology* 70:1594-1596.

Robertson, G. P. 1989. Nitrification and denitrification in humid tropical ecosystems. Pages 55-70 in J. Proctor, ed. *Mineral Nutrients in Tropical Forest and Savanna Ecosystems*. Blackwell Scientific, Cambridge, MA.

Palm, C., **G. P. Robertson**, and P. M. Vitousek. 1989. Nitrogen availability. Pages 162-168 in J. M. Anderson and J. S. I. Ingram, eds. *Tropical Soil Biology and Fertility: A Handbook of Methods*. CAB International, Wallingford, UK.

Robertson, G.P., M.O. Andreae, H.G. Bingemer, P.J. Crutzen, R.A. Delmas, J.H. Duyzer, I. Fung, R.C. Harriss, M. Kanakidou, M. Keller, J.M. Melillo, and G.A. Zavarzin. 1989. Trace gas exchange and the physical and chemical climate: critical interactions. Pages 303-320 in M.O. Andreae and D.S. Schimel, eds. *Trace Gas Exchange between Terrestrial Ecosystems and the Atmosphere*. John Wiley, Berlin.

1992

Schimel, J. P., **G. P. Robertson**, D. Baldocchi, J. E. Bogner, E. A. Davidson, J. Duyzer, D. Ehhalt, D. Fowler, P. Groffman, K. Haider, V. A. Isodorov, L. Klemetsson, J. M. Melillo, K. A. Smith, W. H. Su, and W. Wieprecht. 1992. Impacts of trace gas fluxes in mid-latitude ecosystems. *Ecological Bulletin (Stockholm)* 42:124-132.

1993

Robertson, G.P., J.R. Crum, and B.G. Ellis. 1993. The spatial variability of soil resources following long-term disturbance. *Oecologia* 96:451-456.

Robertson, G.P. 1993. Fluxes of nitrous oxide and other nitrogen trace gases from intensively managed landscapes: a global perspective. Pages 95-108 in L.A. Harper, A.R. Mosier, J.M. Duxbury, and D.E. Rolston. eds. *Agricultural Ecosystem Effects on Trace Gases and Global Climate Change*. American Society of Agronomy, Madison, Wisconsin.

1994

Henrot, J. and **G.P. Robertson**. 1994. Vegetation removal in two soils of the humid tropics: effect on microbial biomass. *Soil Biology and Biochemistry* 26:111-116.

Robertson, G.P. 1994. The impact of soil and crop management practices on soil spatial heterogeneity. Pages 156-161 in C.E. Pankhurst, B.M. Doube, V.V.S.R. Gupta, and P.R. Grace, eds. *Soil Biota Management in Sustainable Farming Systems*, CSIRO Press, Melbourne, Australia.

Robertson, G.P. and K.L. Gross. 1994. Assessing the heterogeneity of below ground resources: quantifying pattern and scale. Pages 237-253 In M.M. Caldwell and R. Pearcy, eds. *Exploitation of Environmental Heterogeneity by Plants: Ecophysiological Processes Above- and Belowground*. Academic Press, San Diego.

Smith, K.A., **G.P. Robertson**, and J.M. Melillo. 1994. Exchange of trace gases between the terrestrial biosphere and the atmosphere in the mid-latitudes. Pages 179-204 in R.G. Prinn, ed. *Global Atmospheric-Biospheric Chemistry*. Plenum Press, NY.

1995

Cavigelli, M.A., **G.P. Robertson**, and M.J. Klug. 1995. Fatty acid methyl ester (FAME) profiles as measures of soil community structure. *Plant and Soil* 170:99-113.

Paustian, K., **G. P. Robertson**, and E. T. Elliott. 1995. Management impacts on carbon storage and gas fluxes (CO₂, CH₄) in mid-latitude cropland and grassland ecosystems. *Advances in Soil Science* 27:69-84.

Robertson, G.P. and D.W. Freckman. 1995. The spatial distribution of nematode trophic groups across a cultivated ecosystem. *Ecology* 76:1425-1432.

1997

Robertson, G.P., K.M. Klingensmith, M.J. Klug, E.A. Paul, J.R. Crum, and B.G. Ellis. 1997. Soil resources, microbial activity, and plant productivity across an agricultural ecosystem. *Ecological Applications*, 7:158-170.

Robertson, G.P. 1997. Nitrogen use efficiency in row crop agriculture: crop nitrogen use and soil nitrogen loss. Pages 347-365 in L. Jackson, ed. *Ecology in Agriculture*, Academic Press, NY.

1998

Ambus, P. and **G.P. Robertson**. 1998. Automated near-continuous measurement of carbon dioxide and nitrous oxide fluxes from soil. *Soil Science Society of America Journal* 62:394-400.

Hedin, L. O., J. C. von Fischer, N. E. Ostrom, B.P. Kennedy, M. G. Brown, and **G. P. Robertson**. 1998. Thermodynamic constraints on nitrogen transformations and other biogeochemical processes at soil-stream interfaces. *Ecology* 79:684-703.

Ostrom, N. E., K. E. Knoke, L. O. Hedin, **G. P. Robertson**, and A. J. M. Smucker. 1998. Temporal trends in nitrogen isotope values of nitrate leaching from an agricultural soil. *Chemical Geology* 146: 219-227.

Robertson, G.P. and E.A. Paul. 1998. Ecological research in agricultural ecosystems: contributions to ecosystem science and to the management of agronomic resources. Pages 142-164 in P.M. Groffman and M.L. Pace (eds) *Successes, Limitations and Frontiers in Ecosystem Science*, Cary Conference VII, Springer-Verlag, NY.

1999

Ambus, P. and **G. P. Robertson**. 1999. Fluxes of CH₄ and N₂O from aspen stands grown under ambient and twice-ambient CO₂. *Plant and Soil* 209:1-8.

Bergsma, T. T., Q.C. Bergsma, N.E. Ostrom, and **G. P. Robertson**. 1999. A heuristic model for the calculation of dinitrogen and nitrous oxide flux from ¹⁵N-labeled soil. *Soil Science Society of America Journal* 63: 1709-1716.

Paul, E. A., D. Harris, H. P. Collins, U. Schulthess, and **G. P. Robertson**. 1999. Evolution of CO₂ and soil carbon dynamics in biologically managed, row-crop agroecosystems. *Applied Soil Ecology* 11: 53-65.

Groffman, P. M., E. A. Holland, D. D. Myrold, **G. P. Robertson**, and X. Zou. 1999. Denitrification. Pages 272-290 in G. P. Robertson, C. S. Bledsoe, D. C. Coleman, and P. Sollins, eds. *Standard Soil Methods for Long-Term Ecological Research*. Oxford University Press, NY.

Holland, E. A., **G. P. Robertson**, J. Greenberg, P. Groffman, R. Boone, and J. Gosz. 1999. Soil CO₂, N₂O, and CH₄ Exchange. Pages 185-201 in G. P. Robertson, C. S. Bledsoe, D. C. Coleman, and P. Sollins, eds. *Standard Soil Methods for Long-Term Ecological Research*. Oxford University Press, NY.

Martinelli, L. A., M. C. Piccolo, A. R. Townsend, P. M. Vitousek, E. Cuevas, W. McDowell, **G. P. Robertson**, O. C. Santos, and K. Treseder. 1999. Nitrogen stable isotopic composition of leaves and soil: tropical versus temperate forests. Pages 45-65 in A. R. Townsend, editor. *New Perspectives on Nitrogen Cycling in the*

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