

**Committee on Agriculture
U.S. House of Representatives
Information Required From Nongovernmental Witnesses**

House rules require nongovernmental witnesses to provide their resume or biographical sketch prior to testifying. If you do not have a resume or biographical sketch available, please complete this form.

1. Name: Keith Paustian
2. Organization you represent: Colorado State University
3. Please list any occupational, employment, or work-related experience you have which add to your qualification to provide testimony before the Committee: _____
(see attached CV)

4. Please list any special training, education, or professional experience you have which add to your qualifications to provide testimony before the Committee: _____
(see attached CV)

5. If you are appearing on behalf of an organization, please list the capacity in which you are representing that organization, including any offices or elected positions you hold: _____
(see attached CV)

PLEASE ATTACH THIS FORM OR YOUR BIOGRAPHY TO EACH COPY OF TESTIMONY.

CURRICULUM VITAE

Keith H. Paustian

Dept. Soil and Crop Sciences, and
Natural Resource Ecology Laboratory
Colorado State University
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EDUCATION:

- 1987 Ph.D. Systems Ecology/Agroecology, Swedish Univ. of Agric. Sciences, Uppsala
1980 M.Sc. Forest Ecology, Colorado State University, Fort Collins
1977 B.Sc. Forest Biology, Colorado State University, Fort Collins
1976-1977 - Forest Science, Agricultural University of Norway, Ås

PROFESSIONAL EXPERIENCE:

- 2017-present University Distinguished Professor, Dept. Soil and Crop Science, Colorado St. Univ.
1996-present Senior Research Scientist, Natural Resource Ecology Lab, Colorado State University
2001-2016 Professor, Department of Soil and Crop Sciences, Colorado State University
1993-1995 Research Scientist, Natural Resource Ecology Lab, Colorado State University
1991-1993 Research Assoc. Professor, W.K. Kellogg Biological Station, Michigan State University
1989-1990 Research Associate, W.K. Kellogg Biological Station, Michigan State University
1987-1989 Research Scientist, Dept. of Ecology and Environmental Research, Swedish University of Agricultural Sciences
1980-1986 Research Assistant, Swedish Univ. of Agricultural Sciences
1980 Programmer, Natural Resource Ecology Lab, Colorado University
1978-1980 Research Assistant, Dept. of Forest Sciences, Colorado State University
1975-1976 Research Technician, Norwegian Institute of Forest Research, Ås, Norway

BIOGRAPHICAL OVERVIEW:

Keith Paustian is University Distinguished Professor in the Department of Soil and Crop Sciences and Senior Research Scientist at the Natural Resource Ecology Laboratory at Colorado State University. A major focus of his work involves modeling, field and laboratory studies of soil organic matter and nitrogen dynamics in managed ecosystems, and development of inventory methods, policy analyses and assessment tools for soil carbon sequestration and greenhouse gas emissions from soils. He has published over 380 journal articles and book chapters, with more than 47,000 citation and an H-index of 99. Previous and current research activities include development of models and inventory methodology used to estimate US soil C and N₂O emissions that are reported annually by EPA to the UNFCCC; development of a web-based tool (COMET-Farm™) for estimating on-farm greenhouse gas (GHG) emissions and carbon sequestration used by USDA (<http://cometfarm.com/>) and project-scale systems for GHG assessment of sustainable land management projects in developing countries (<http://www.carbonbenefitsproject.org/>). He also served as project director for the Bioenergy Alliance Network of the Rockies (BANR - <http://banr.nrel.colostate.edu/>) which is a consortium of universities, industry and the US Forest Service, researching the potential for sustainable bioenergy production from beetle-kill trees and forest residues. Professional service activities include Coordinating Lead Author for the IPCC 2006 National Greenhouse Gas Inventory Methods and the IPCC 2003 Good Practice Guidance for Land Use, Land Use Change and Forestry (LULUCF) and two National Academy of Science committees (in 2010-11 and 2018-19) related to land use, greenhouse gases and climate change mitigation. He served as a member of the US Carbon Cycle Science Steering Group, which provides expert input to Federal Agencies involved in climate and carbon cycle research. He also served on the Voluntary Carbon Standard Steering Committee for Agriculture, Forestry and Other Land Use (AFOLU) and on numerous other national and international committees involving climate and carbon cycle

research. He is a Fellow of the Soil Science Society of America, recipient of the Soil Science Society of America's Outstanding Research Award in 2015, and 2019 winner of the Global Foodshot Groundbreaker Award.

GRANTS FUNDED (last 10 years):

- 2021-24: Co-PI "Leveraging multi-sector partnerships to measure and predict soil health and climate change mitigation outcomes associated with commonly recommended rangeland management practices", FFAR/Point Blue (\$205,916)
- 2020-21: PI "Modeling environmental impacts of synthetic and dairy-manure based fertilizers in US dairy farms", US Dairy Innovation Center (\$98,055)
- 2020-21: PI "Enhancing functionality and use of COMET Greenhouse Gas Assessment and Water Quality tools", USDA/NRCS (\$450,000)
- 2017-21: Co-PI "Decision support to quantify GHG mitigation and ecosystem services from organic production systems", USDA/NIFA (\$500,000)
- 2017-22: Co-PI "Center for Bioenergy Innovation (CBI)", DOE/Oak Ridge National Laboratory (\$350,000)
- 2017-21: Co-PI "Root genetics in the field to understand drought adaptations and carbon sequestration" ARPA-E/DOE (\$6,019,238)
- 2018-23: Co-PI "Emission/removal estimates for the U.S. GHG Inventory's AFOLU Sector and economic analyses and projections", USEPA (\$225,000)
- 2019-22: Co-PI "Development of a Scalable Crowdsourcing Platform for Soil Health Discovery", FFAR (\$1,034,444)
- 2017-22: Co-PI "Reconciling economic and biophysical perspectives on marginal land for sustainable bioenergy crop production", USDA/NIFA (\$499,000).
- 2019-21: PI "COMET-Explorer: A state and regional-scale assessment and planning tool for agricultural soil C sequestration", ClimateWorks Foundation (\$230,000).
- 2019-22: Co-PI "Assessing the Effectiveness of Soil Health Practices in Enhancing Soil Organic Carbon in Maryland", Univ. MD (\$161,852)
- 2016-18: PI "Measurement and Modeling of Soil C Storage and Greenhouse Gas Emissions from Southern Pine Biofuel Feedstocks", Shell Inc. (\$622,000)
- 2016-18: PI "Sustainable Land Management and Climate Change Mitigation Co-benefits", GEF/UNEP (\$1,804,800)
- 2015-16: PI "Addition of Ten Specialty Crops into the COMET-Farm Tool", California Department of Food and Agriculture (\$148,000)
- 2015-18: PI "Maintenance and Enhanced Development of COMET-Farm and Web-Based Tools for Implementation of Agricultural Conservation Practices", USDA/NRCS (\$680,000)
- 2013-18: PI "Biomass Alliance Network of the Rockies (BANR) – Sustainable biofuel feedstocks from beetle-kill wood and other forest biomass", USDA/NIFA CAP program (\$10,000,000).
- 2013-15: PI "Comprehensive carbon metric tools and integrated architecture for environmental product and building declarations", NSF (\$800,000).
- 2014: PI "Analysis of grazing management options using the DayCent model: Support for rangeland GHG mitigation" Marin C Project and Rathmann Family Foundation (\$42,000).
- 2014-16: Co-PI "Greenhouse gas methods development", USDA/OCE-GCPO (\$300,000)
- 2014-17: PI "Whole-farm GHG estimation and environmental diagnostics platform (COMET-Global), FACCE-JPI(EU) & USDA (\$150,000).
- 2013-15: PI "Modeling the soil carbon and GHG flux of sugarcane bioenergy production", Shell Inc. (\$177,000)
- 2012-17: Co-PI "Assessing Water Management Tradeoffs and Targets under Climatic and Land Use Uncertainty", USDA (\$1,500,000).
- 2013-14: PI "Uncertainty, validation and streamlining for COMET-Farm", USDA/NRCS (\$328,000)
- 2013-14: PI "Borlaug Fellow Training Program – Mexico", USAID (\$32,000).

- 2013: PI "Evaluating management opportunities for reducing GHG footprint of corn grain as a feedstock for biofuels: A case study for southwest MN", Huttner Strategies (\$16,000)
- 2013-16: Co-PI "Decision support tools, drought tolerance, and innovative soil and water management strategies to adapt semi-arid irrigated cropping systems to drought", USDA/NRCS-CIG (\$882,924)
- 2012-13: Co-PI "Full accounting of Pyrogenic-C dynamics at the watershed scale: A unique opportunity offered by the High Park Fire", NSF-Rapid program (\$197,000)
- 2011-14: Co-PI "Soils, Land Use and Climate Change: A new Baccalaureate concentration", USDA/Higher Education Challenge (\$149,000).
- 2011: Co-PI "Processor and farm supply specific life cycle assessment of biobutanol in a Minnesota biorefinery: baseline feedstock GHG emissions", GEVO Inc. (\$30,000)
- 2011-16: PI "Decision support tool for integrated biofuel greenhouse gas emission footprints", USDA (\$800,000)
- 2011-16: Co-PI "New tools for soil carbon assessment and greenhouse gas accounting and incentives for mitigation in corn cropping systems", USDA (subcontract from Cornell) (\$1,287,000)
- 2010-14: PI "Developing science-based methods and guidelines for quantifying greenhouse gas sources and sinks in the forest and agriculture sectors", USDA (subcontract from ICF Int'l) (\$911,000)
- 2010-14: Co-PI "Corn Stover Regional Partnership", DOE/SunGrant (\$120,000)
- 2009-13: PI "Carbon Benefits Project: Modelling, Measurement and Monitoring", GEF/UNEP (\$2,322,000)
- 2009-11: Co-PI "Quantifying soil carbon sequestration potential through improved pasture management", EPA (\$250,000)
- 2008-13: Co-PI "IGERT: Integrated Graduate Education in Biorefining and Biofuels", NSF (\$2,830,000).
- 2008-12: PI "Whole farm GHG accounting – COMET-Farm", USDA/NRCS (\$1,200,000).
- 2008-10: PI "Science Support for Greenhouse Gas Mitigation Practices on Colorado Managed Lands", CO Governor's Energy Office (\$175,000).
- 2008-11: Co-PI "Resolving net CO₂ exchange in the mid-continent region of North America", NASA (\$1,090,000).
- 2007-12: Co-PI "US Soil C and N₂O Greenhouse Gas Emission Inventories and Inventory Capacity-Building in Developing Countries", EPA (\$1,860,000)
- 2004-11: Co-PI "CO₂ Fluxes between Agricultural Lands and the Atmosphere: Towards more Complete Accounting by Integrating Remote Sensing with Simulation Modeling", USDA/NASA (\$1,100,000)

TEACHING/MENTORING:

Classes as Principal Instructor

- Graduate course (SC540) "Soil-Plant-Nutrient Relations", Spring semester (every other year), Dept. of Soil and Crop Sciences.
- Graduate course (SC680) "Modeling ecosystem biogeochemical processes", Spring semester (every other year), Dept. of Soil and Crop Sciences.
- Graduate course (AGRI/ENGR 680) "Bioenergy Technology" (co-taught with 3 instructors), Fall semester (every year)
- Graduate course (AGRI/ENGR 681) "Bioenergy Policy, Economics, and Assessment" (co-taught with 3 instructors), Spring semester (every year)

Graduate student advisor

- present Peter Means (PhD) Dept. of Soil and Crop Science, Colorado State University
- present Ellie Ellis (PhD) Dept. of Soil and Crop Science, Colorado State University
- 2018 Trung Nyguen (PhD) Dept. of Soil and Crop Science, Colorado State University
- 2018 Preeyarat Chailangka (MSc) Dept. of Soil and Crop Science, Colorado State University
- 2017 Yao Zhang (PhD) Dept. of Soil and Crop Science, Colorado State University

- 2017 Jeff Kent (PhD) Graduate Degree Program in Ecology, Colorado State University
 2015 Eleanor Campbell (PhD) Graduate Degree Program in Ecology, Colorado State University
 2015 John Field – coadvisor (PhD) Dept. of Mechanical Engineering Colorado State University
 2014 Kris Nichols (MSc) Dept. of Soil and Crop Science, Colorado State University
 2013 Carolyn Hoagland (MSc) Dept. of Soil and Crop Science, Colorado State University
 2013 Amy Swan (MSc) Graduate Degree Program in Ecology, Colorado State University
 2008 Gabe Olchin (PhD) Dept. of Soil and Crop Science, Colorado State University
 2006 Erandi Lokupitiya (PhD) Graduate Degree Program in Ecology, Colorado State University
 2006 Cathy Stewart, (PhD) Graduate Degree Program in Ecology, Colorado State University
 2004 Karolien Denef (PhD) Univ. of Leuven, Belgium (all research work was done at CSU)
 2003 John Brenner, (MSc) Dept. of Soil and Crop Science, Colorado State University
 2003 Rudolfo Delgado, (PhD) Dept. of Soil and Crop Science, Colorado State University

Graduate Student Committees

Colorado State University

2016-present, Agustin Nunez,(PhD), Dept. of Soil and Crop Science

- 2017-2021, Haley Summers (PhD), Dept of Civil and Environmental Engineering
- 2017-2021, Chenda Deng (PhD), Dept of Civil and Environmental Engineering
- 2016-2020, Briana Taylor (PhD), Dept of Civil and Environmental Engineering
- 2016-2020, Samantha Mosier (PhD), Dept. of Soil and Crop Science
- 2015-2020, Tony Vorster (PhD), Graduate Degree Program in Ecology
- 2012-2017, Sarah Fulton-Smith (PhD), Graduate Degree Program in Ecology
- 2012-2020, Ram Gurung (PhD), Graduate Degree Program in Ecology
- 2012-2014, Jakrapun Suksawat (PhD), Dept of Agriculture and Resource Economics
- 2013-2014, Jiawei Fan (MSc), Dept. of Construction Management
- 2012-2013, Biljana Orescanin (MSc), Dept. of Atmospheric Sciences
- 2010-2013, Grace Lloyd (MSc), Dept. of Soil and Crop Sciences
- 2010-2014, Barbara Fricks (PhD), Graduate Degree Program in Ecology
- 2009-2013, Liaw Bata (PhD), Dept. of Mechanical Engineering
- 2009-2012, Samuel Adams (PhD), Dept. of Agricultural & Resource Economics
- 2007-2011, Nick Parazoo (PhD), Dept. of Atmospheric Sciences
- 2007-2010, Rod Simpson (PhD), Graduate Degree Program in Ecology
- 2006-present, Shannon Spencer (PhD), Graduate Degree Program in Ecology
- 2005-2008, Michelle Haddix (MSc), Graduate Degree Program in Ecology
- 2001-2003, Steve Delgrosso (PhD) Dept of Range Ecosystems Science
- 1995-1998, Johan Six (PhD) Dept. of Soil and Crop Science
- 1995-1999, Serita Frey (PhD) Graduate Degree Program in Ecology
- 1996-1999, Romulo Menezes (PhD) Dept. of Soil and Crop Science

Montana State University

2001-2006, Ross Bricklemeyer (MSc) Dept of Soil and Crop Science

Ohio State University

1995-1998, Joann Whalen (PhD) Dept. of Entomology

Michigan State University

1989-1993, Timothy Lynam (PhD) Dept. of Soil and Crop Science

1991-1993, Kurt Patzer (Msc) Dept of Computer Sciences

International

1997 External examiner for PhD dissertation, University of Adelaide.

1998 External examiner for PhD dissertation, Swedish University of Agricultural Sciences.

1998-99 MSc (Thesis project co-advisor) Heleen Bossuyt, Karolien Denef, Steven DeGryze,

Katholieke Universiteit Leuven, Belgium

2003-04 Carlos E. Cerri (PhD), University of Sao Paulo, Brazil
 2003-05 Jorge Alvero (PhD), University of Lleida, Spain
 2005-06 Marcelo Galdos (PhD), University of Sao Paulo, Brazil
 2006 External examiner for PhD dissertation, Royal Technical University, Stockholm, Sweden
 2006 External examiner for PhD dissertation, Second University of Naples, Italy
 2007-11 Signe Borgen (PhD), Norwegian University of Environmental Sciences, Aas, Norway
 2011 Leidivan Almeida Frazão (PhD) University of Sao Paulo, Brazil
 2012 External examiner (PhD), University of Wageningen, Netherlands
 2012 Carolina Braga Brandani (PhD) University of Sao Paulo, Brazil
 2012 Elisa Cocco (PhD) University of Padua, Italy
 2013 Daniel Plaza Bonilla (PhD) University of Lleida, Spain
 2013-14 Adriana Marcela Silva-Olaya (PhD) University of Sao Paulo, Brazil
 2015-16 Zhong Du Chen (PhD) China Agricultural University, Beijing, China
 2015-16 Dener Márcio da Silva Oliveira (PhD) University of Sao Paulo, Brazil
 2018-19 Junior Damian (PhD) University of Sao Paulo, Brazil

INVITED PRESENTATIONS: 2020

Jan 2020	CO ₂ removal through regenerative agricultural soil management, EDF Conf. on “Innovation’s Role in Achieving Climate Stability”, San Francisco
Mar 2020	Panel Discussion on Organic Matter/Carbon and Soil Health, Greenleaf conference on “Sensing Technologies and Applications for Soil Health”
Mar 2020	Carbon Farming: Managing soils for CO ₂ drawdown and agroecosystem sustainability, Webinar for Amer. Resource Conserv. Tech. Initiative on Carbon, Univ. Nebraska
April 2020	COMET-Farm: USA Farm-scale Modeling, CIRCASA EU Webinar
April 2020	Modeling Carbon/Prediction, CSU Industry Consortium
April 2020	Soil Carbon as CDR Strategy, Energy Futures Initiative
May 2020	Thoughts on prospects, barriers and futures for soil carbon solutions, 4 per mille North American Conference
June 2020	Carbon Farming for the Next Millennium, Webinar – Wolf Farming Fast and Slow
June 2020	Unlocking the potential for sustainable land management to promote carbon drawdown, climate resilience and soil health, World Bank Symposium on Innovating Soil 3.0
Aug 2020	Soil Carbon Briefing, Jeanna King Foundation
Sept 2020	Carbon Lockdown: Farming Helps Save the Planet, Radically Rural Summit
Sept 2020	Soil Carbon and GHG Accounting Systems: Needs, Challenges and Emerging Opportunities, World Bank Symposium on Carbon Finance
Sept 2020	Why care about soil organic matter?, Society Environmental Journalist Annual Meeting
Oct 2020	Modeling Mitigation and Adaptation Co-Benefits, AgMIP
Nov 2020	Agriculture, soil carbon and climate mitigation – a quick overview, Arrell Food Summit, Guelph Univ., Ontario
Dec 2020	Cutting the Gordian Knot – Reliable, low-cost quantification of CO ₂ removal and GHG mitigation in agricultural soils, AGU annual meeting
Dec 2020	Soil Solutions for Carbon Drawdown at Colorado State University, NCEC Consortium Annual Meeting

Publication list – Keith Paustian

Total # of citations: 47,405; H index 99, i10-index 255 (Google Scholar, 4/11/2021)

Refereed Journals:

- Rosswall, T. and Paustian, K. 1984. Cycling of nitrogen in modern agricultural systems. *Plant Soil* 76: 3-21.
- Paustian, K. and Bonde, T. 1987. Interpreting incubation data on nitrogen mineralization from soil organic matter. *INTECOL Bull.* 15:101-112.
- Paustian, K. and Schnürer, J. 1987. Fungal growth response to carbon and nitrogen limitation. A theoretical model. *Soil Biol. Biochem.* 19:613-620.
- Paustian, K. and Schnürer, J. 1987. Fungal growth response to carbon and nitrogen limitation. Application of a model to laboratory and field data. *Soil Biol. Biochem.* 19:621-629.
- Andrén, O. and Paustian, K. 1987. Barley straw decomposition in the field - A comparison of models. *Ecology* 68:1190-1200.
- Hansson, A.-C., Pettersson, R. and Paustian, K. 1987. Shoot and root production and nitrogen uptake in barley, with and without nitrogen fertilization. *J. Agronomy and Crop Sciences*, 158:163-171.
- Johnsson, H., Bergström, L., Jansson, P-E. and Paustian, K. 1987. Simulation of nitrogen dynamics and losses in agricultural soils. *Agriculture, Ecosystems and Environment* 18, 333-356.
- Andrén, O., Paustian, K. and Rosswall, T. 1988. Soil biotic interactions in the functioning of agroecosystems. *Agriculture, Ecosystems and Environment*, 24:57-68.
- Lagerlöf, J., Andrén, O. and Paustian, K. 1989. Dynamics and contribution to carbon flows of enchytraeidae (Oligochaeta) under four cropping systems. *J. Applied Ecology* 26:183-199.
- Paustian, K., Andrén, O., Clarholm, M., Hansson, A.-C., Johansson, G., Lagerlöf, J., Lindberg, T., Pettersson, R. and Sohlenius, B. 1990. Carbon and nitrogen budgets of four agroecosystems with annual and perennial crops, with and without N fertilization. *J. Applied Ecology*, 27:60-84.
- Svensson, B., Klemedtsson, L., Simkins, S., Paustian, K. and Rosswall, T. 1991. Soil denitrification in three cropping systems characterized by differences in nitrogen and carbon supply. I. Rate-distribution frequencies, comparison between systems and seasonal N-losses. *Plant and Soil*, 138:257-271.
- Paustian, K., Parton, W.J., and Persson, J. 1992. Modeling soil organic matter in organic-amended and N-fertilized long-term plots. *Soil Sci. Soc. Am. J.*, 56:476-488.
- Barnwell, T.O., Jackson, R.B., Elliott, E.T., Burke, I.C., Cole, C.V., Paustian, K., Paul, E.A., Donigian, A., Patwardhan, A., Rowell, A. and Weinrich, K. 1992. An approach to assessment of management impacts on agricultural soil carbon. *Water, Air and Soil Pollution*, 64:423-435.
- Cole, C.V., K. Paustian, E.T. Elliott, A.K. Metherell, D.S. Ojima and W.H. Parton. 1993. Analysis of agroecosystem carbon pools. *Water, Air and Soil Pollution*, 70:357-371.
- Paustian, K., E.T. Elliott, H.P. Collins, C.V. Cole and E.A. Paul. 1995. Use of a network of long-term experiments for analysis of soil carbon dynamics and global change: The North America model. *Aust. J. Exper. Agr.* 35: 929-939.
- Paustian, K., E.T. Elliott, G.A. Peterson and K. Killian. 1996. Modelling climate, CO₂ and management impacts on soil carbon in semi-arid agroecosystems. *Plant and Soil*, 187:351-365.
- Paustian, K., E. Levine, W.M. Post and I.M. Ryzhova. 1997. The use of models to integrate information and understanding of soil C at the regional scale. *Geoderma* 79:227-260.
- Cole, C.V., J. Duxbury, J. Freney, O. Heinemeyer, K. Minami, A. Mosier, K. Paustian, N. Rosenberg, N. Sampson, D. Sauerbeck and Q. Zhao. 1997. Global estimates of potential mitigation of greenhouse gas emissions by agriculture. *Nutrient Cycling in Agroecosystems* 49:221-228.
- Paustian, K., O. Andren, H. Janzen, R. Lal, P. Smith, G. Tian, H. Tiessen, M. van Noordwijk and P. Woomer. 1997. Agricultural soil as a C sink to offset CO₂ emissions. *Soil Use and Management* 13:230-244.

- Paustian, K., E.T. Elliott, M.R. Carter. 1998. Tillage and crop management impacts on soil C storage: Use of long-term experimental data. *Soil Tillage Research*, vol 47:vii-xii.
- Paustian, K., C.V. Cole, D. Sauerbeck and N. Sampson. 1998. CO₂ mitigation by agriculture: An overview. *Climatic Change* 40:135-162.
- Rosenberg, N., C.V. Cole and K. Paustian. 1998. New technologies, policies and measures offer potential to mitigate emissions while improving productivity and ecosystem health: An introductory editorial. *Climatic Change* 40:1-5.
- Six, J. E.T. Elliott, K. Paustian and J.W. Doran. 1998. Aggregation and organic matter storage in cultivated and native grassland soils. *Soil Sci. Soc. Am. J.* 62:1367-1377.
- Doran, J.M., E.T. Elliott and K. Paustian. 1998. Soil microbial activity, nitrogen cycling, and long-term changes in organic carbon pools as related to fallow tillage management. *Soil Tillage Research* 49:3-18.
- Frey, S.D., E.T. Elliott and K. Paustian. 1999. Bacterial and fungal abundance and biomass in conventional and no-tillage agroecosystems along two climatic gradients. *Soil Biol. Biochem.* 31:573-585.
- Frey, S.D., E.T. Elliott and K. Paustian. 1999. Application of the hexokinase-glucose-6-phosphate dehydrogenase enzymatic assay for measurement of glucose in amended soil. *Soil Biol. Biochem.* 31:933-935.
- Six, J. E.T. Elliott and K. Paustian. 1999. Aggregate and soil organic matter dynamics under conventional and no-tillage systems. *Soil Sci. Soc. Am. J.* 63:1350-1358.
- Guggenberger, G., E.T. Elliott, S.D. Frey, J. Six and K. Paustian. 1999. Microbial contributions to the aggregation of a cultivated grassland soil amended with starch. *Soil Biol. Biochem.* 31:407-419.
- Guggenberger, G., S.D. Frey, J. Six, E.T. Elliott, and K. Paustian. 1999. Glucosamine and muramic acid patterns in conventional and no-tillage agroecosystems. *Soil Science Soc. Amer. J.* 63:1188-1198.
- Paustian, K., E.T. Elliott, J. Six and H.W. Hunt. 2000. Management options for reducing CO₂ emissions from agricultural soils. *Biogeochemistry* 48:147-163.
- Bruce, J.P., M. Frome, E. Haites, H. Janzen, R. Lal and K. Paustian. 1999. Carbon sequestration in soils. *J. Soil Water Conserv.* 54:382-389.
- Whalen, J.K., K. Paustian and R.W. Parmelee. 1999. Simulation of growth and flux of carbon and nitrogen through earthworms. *Pedobiologia* 43:537-546.
- Collins, H.P., E.T. Elliott, K. Paustian, L.G. Bundy, W.A. Dick, D.R. Huggins, A.J.M. Smucker and E.A. Paul. 2000. Soil carbon pools and fluxes in long-term corn belt agroecosystems. *Soil Biol. Biochem.* 32:157-168.
- Frey, S.D., E.T. Elliott, K. Paustian and G. Peterson. 2000. Fungal translocation as a mechanism of exogenous nitrogen inputs to decomposing surface residues in a no-tillage agroecosystem. *Soil Biology & Biochemistry* 32: 689-698.
- Six, J., R. Merckx, K. Kimpe, E.T. Elliott and K. Paustian. 2000. A re-evaluation of the enriched labile soil organic matter fraction. *Eur. J. Soil Sci.* 51:283-293.
- Six, J. E.T. Elliott and K. Paustian and C. Combrink. 2000. Soil structure and soil organic matter: I. Distribution of aggregate size classes and aggregate associated carbon. *Soil Sci. Soc. Amer. J.* 64:681-689.
- Six, J. E.T. Elliott and K. Paustian. 2000. Soil structure and soil organic matter: II. A normalized stability index and the effect of mineralogy. *Soil Sci. Soc. Amer. J.* 64:1042-1049.
- Six, J., Elliott, E.T. and K. Paustian, 2000. Soil macroaggregate turnover and microaggregate formation: A mechanism for C sequestration under no-tillage agriculture. *Soil Biology & Biochemistry* 32:2099-2103.
- Six, J., Guggenberger, G., K. Paustian, L. Haumaier, E.T. Elliott, and W. Zech. 2001. Sources and composition of physically defined soil organic matter fractions. *Eur. J. Soil Sci.* 52:607-618.
- Bossuyt, H., K. Denef, J. Six, S.D. Frey, R. Merckx, and K. Paustian. 2001. Influence of microbial populations and residue quality on aggregate stability. *Appl. Soil Ecol.* 16:195-208.

- Frey, S.D., V.V.S.R. Gupta, E.T. Elliott and K. Paustian. 2001. Protozoan grazing affects estimates of carbon utilization efficiency of the soil microbial community. *Soil Biology & Biochemistry* 33:1759-1768.
- Conant, R.T., K. Paustian and E.T. Elliott. 2001. Grassland management and conversion into grassland: Effects on soil carbon. *Ecological Application* 11:343-355.
- Denef, K., J. Six, H. Bossuyt, S.D. Frey, E.T. Elliott, R. Merckx, and K. Paustian. 2001. Influence of wet-dry cycles on the interrelationship between aggregate, particulate organic matter, and microbial community dynamics. *Soil Biology and Biochemistry* 33:1599-1611.
- Denef, K., J. Six, R. Merckx, and K. Paustian. 2001. Importance of macroaggregate turnover in controlling carbon sequestration in soils: effect of physical disturbance induced by dry-wet cycles. *Soil Biology and Biochemistry* 33:2145-2153.
- Antle, J.M., S.M. Capalbo, E.T. Elliott, H.W. Hunt, S. Mooney and K. Paustian. 2001. Research needs for understanding and predicting the behavior of managed ecosystems: lessons from the study of agroecosystems. *Ecosystems* 4:723-735.
- Eve, M.D., M. Sperow, K. Paustian and R.F. Follett. 2002. National-scale estimation of changes in soil carbon stocks on agricultural lands. *Environmental Pollution* 116: 431-438.
- Conant, R.T. and K. Paustian. 2002. Spatial variability of soil organic carbon in grasslands: implications for detecting change at different scales. *Environmental Pollution* 116:127-135.
- Conant, R.T. and K. Paustian 2002. Potential soil carbon sequestration in overgrazed grassland ecosystems. *Global Biogeochemical Cycles* 16:90_1-90_9.
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