

# **Elise Pendall**

Professor of Soil Science  
Theme Leader, Soil Biology & Genomics  
Hawkesbury Institute for the Environment  
Western Sydney University

## **BIOGRAPHICAL SKETCH**

I am an interdisciplinary soil scientist and ecosystem ecologist with broad expertise in climate change and land management impacts on carbon, nutrient and water cycling. I receive funding from numerous federal and state agencies and agricultural industries. Recent projects investigate plant-soil-microbe interactions in the rooting zone (rhizosphere) to evaluate mechanisms of nutrient uptake and organic matter decomposition. I also study biosphere-atmosphere greenhouse gas exchanges in croplands, rangelands and forests. I have taught undergraduate and graduate courses including Biogeochemistry, Ecosystems in a Changing World, Environmental Science, and have co-designed related curricula for BS, MS and PhD degrees. I lead the Soil Biology and Genomics Research Theme (9 faculty, 6 postdocs, 13 PhD students) and serve on the Council of the American Geophysical Union, the world-leading Earth and Space Science society.

## **EDUCATION**

1997, Ph.D., Geosciences, University of Arizona, Tucson. Advisor: Stephen W. Leavitt  
1989, M.S., Soil Science, University of California, Berkeley. Advisor: Ronald Amundson  
1983, B.S., Soil Science/Natural Resources, Cornell University, Ithaca, NY. (Honors)

## **ACADEMIC POSITIONS**

2014-present: Professor, Hawkesbury Institute for the Environment, Western Sydney University, Australia.  
2008-2014: Associate Professor, Botany Department and Program in Ecology, University of Wyoming.  
2008-2009: Visiting Associate Professor, School of Plant Science, University of Tasmania, Hobart, Australia.  
2004-2008: Assistant Professor, Program in Ecology, University of Wyoming.  
2002-2008: Assistant Professor, Botany Department, University of Wyoming.  
2000-2002: Research Assistant Professor, Institute of Arctic and Alpine Research, University of Colorado.  
1998-2000: NOAA Climate and Global Change Post-Doctoral Fellow, University of Colorado and National Oceanic and Atmospheric Administration.

## **SYNERGISTIC ACTIVITIES & LEADERSHIP (last 5 years)**

American Geophysical Union (AGU) Biogeosciences Section President-Elect, 2017-2018; President, 2019-2020.  
Chair, Global Biogeochemical Cycles journal Editor in Chief search committee, 2017.  
AGU Biogeosciences Section Fellows Committee Chair, 2017-2018.  
Women in Science of Western Sydney, 2017-present.  
AGU Ethics Task Force member, 2016-2017.  
Second State of the Carbon Cycle Report (SOCCR2) Lead author, Grasslands chapter, 2016-present.  
Theme Leader, Soil Biology and Genomics, Western Sydney University, 2015-present.  
Executive Council, Hawkesbury Institute for the Environment, Western Sydney University, 2015-present.  
US National Climate Assessment – Grassland Indicator Team, 2013-2015.  
Director, Univ. Wyoming, Earth System Science undergraduate degree program, 2013-2014.  
National Ctr. for Ecological Analysis & Synthesis (NCEAS) Science Advisory Board, 2009-2012.

## CONTRACTS & GRANTS

### Past grant income (*Univ. Wyoming, Univ. of Colorado, Univ. Arizona*)

Lead PI: 15 grants or contracts totaling \$3,900,000 (USDA, NSF, DOE, McIntyre-Stennis, NASA, NRC, etc.)

Co-PI: 15 grants or contracts totaling \$3,150,000 (NSF, DOE, Wyoming Water Development Council, etc.)

### Currently Funded Projects as PI

2017-2019. Pendall E, Tjoelker M, Arndt S, van Gorsel E, Haverd V, Davidson EA. Temperature sensitivity of soil respiration and its components in SE Australia. Australian Research Council – Discovery Program. \$405,000.

### Currently Funded Projects as co-PI

2018-2022. Boer M, Choat B, Clarke H, Medlyn B, Pendall E, Tjoekler M. Burning for a healthy future: People and their environments. New South Wales Office of Environmental Health. \$700,000.

2017-2019. Power S, Anderson I, Rakesh N, Singh B, Tjoelker M, Pendall E, Tissue D, Powell J, Macdonald C, Carrillo Y, Moore B, Plett J. Sustainable Pastures and Climate Extremes (PACE). Supported by Meat and Livestock Association and Dairy Australia. \$1,900,000.

2017-2018. Carrillo Y, Pendall E, Macdonald C. Improving soil functional health to reduce greenhouse gas emissions in systems using BioDunder® -derived liquid fertilizer. Wilmar Bioethanol. \$45,000.

2016. Boer M, Pendall E. Terrestrial Ecosystem Research Network New South Wales, Research Attraction and Acceleration Program. \$40,000.

2014-2017. Boer M, Pendall E. Cumberland Plains SuperSite. Australian TERN Funding \$83,000.

2012-2017. Water in a Changing West: The Wyoming Center for Environmental Hydrology and Geophysics. PI's Miller SN, Holbrook SW. NSF, Research Infrastructure Improvement, \$20,000,000.

### Pending projects

Medlyn B, Pendall E, Power S, Tissue D, Knapp A, Smith M. 2018-2020. Brown is the new green: Measuring and modeling grassland responses to drought and heat. Australian Research Council – Discovery Program. \$550,000.

Pendall E, Milham P, Holford P, Dossetto T. 2017-2019. Optimizing magnesium nutrition in pasture crops and sugar cane with stable isotope tracers. K+S Group (<http://www.kali-gmbh.com/uken/fertiliser/>). \$138,000.

## PUBLICATIONS

### Citation Statistics (current Sept 10, 2017)

Google Scholar	All	Since 2012
<u>Citations</u>	4689	3152
<u>h-index</u>	39	32
<u>i10-index</u>	81	70

### Selected Publications (of 110 journal articles & book chapters +12 in review; \*my students or postdocs)

Suseela V, Tharayil N, Pendall E, Rao A. Warming and elevated CO<sub>2</sub> alter the suberin chemistry in roots of photosynthetically divergent grass species. In press, *Annals of Botany*.

\*Nelson LA, Blumenthal DM, Williams DG, Pendall E. Digging into the roots of belowground carbon cycling following seven years of Prairie Heating and CO<sub>2</sub> Enrichment (PHACE), Wyoming USA. *Soil Biology and Biochemistry* 115: 169-177.

Hortal-Botifol S, Plett KL, Cresswell T, Johansen M, Pendall E, Anderson IC. Role of plant-fungal nutrient trading and host control in determining the competitive success of ectomycorrhizal fungi. In press, *ISME Journal*.

- Van Groenigen KJ, Osenberg C, Terrer C, Carrillo Y, Dijkstra FA, Heath J, Nie M, Pendall E, Phillips R, Hungate B. Faster turnover of new soil carbon inputs under increased atmospheric CO<sub>2</sub>. *Global Change Biology* 23: 4420-4429. DOI: 10.1111/gcb.13752
- \*Sorokin Y, \*Zelikova TJ, Blumenthal D, Williams DG, Pendall E. Evapotranspiration responses to elevated carbon dioxide and temperature in a Great Plains grassland. *Ecohydrology* 10 DOI: 10.1002/eco.1880.
- \*Carrillo Y, Bell C, Koyama A, Canarini A, Boot C, Wallenstein M, Pendall E. (2017). Plant traits, stoichiometry and microbes as drivers of decomposition in the rhizosphere in a temperate grassland. *Journal of Ecology* 105: 1750-1765.
- De Kauwe, MG, BE Medlyn, AP Walker, S Zaehle, S Asao, B Guenet, AB Harper, T Hickler, A Jain, YQ Luo, X Lu, K Luus, WJ Parton, S Shu, Y-P Wang, C Werner, J Xia, E Pendall, JA Morgan, EM Ryan, Y Carrillo, FA Dijkstra, TJ Zelikova and RJ Norby (2017). Challenging terrestrial biosphere models with data from the long-term multi-factor Prairie Heating and CO<sub>2</sub> Enrichment experiment. *Global Change Biology* 23: 3623-3645. DOI: 10.1111/gcb.13643.
- van Gorsel, E, S Wolf, J Cleverly, P Isaac, V Haverd, C Ewenz, S Arndt, J Beringer, VR de Dios, BJ Evans, A Griebel, LB Hutley, T Keenan, N Kljun, C Macfarlane, WS Meyer, I McHugh, E Pendall, SM Prober and R Silberstein (2016). Carbon uptake and water use in woodlands and forests in southern Australia during an extreme heat wave event in the "Angry Summer" of 2012/2013. *Biogeosciences* 13: 5947-5964. DOI: 10.5194/bg-13-5947-2016.
- \*Tucker, CL, \*\*S Tamang, E Pendall and K Ogle (2016). Shallow snowpack inhibits soil respiration in sagebrush steppe through multiple biotic and abiotic mechanisms. *Ecosphere* 7. DOI: 10.1002/ecs2.1297.
- \*Ryan, EM, K Ogle, D Peltier, AP Walker, MG De Kauwe, BE Medlyn, E Pendall and et al. (2016). Gross primary production responses to warming, elevated CO<sub>2</sub>, and irrigation: quantifying the drivers of ecosystem physiology in a semiarid grassland. *Global Change Biology* 23: 3092-3106. DOI: 10.1111/gcb.13602.
- \*Reed, DE, BE Ewers, E Pendall, J Frank and R Kelly (2016). Bark beetle-induced tree mortality alters stand energy budgets due to water budget changes. *Theoretical and Applied Climatology*. DOI: 10.1007/s00704-016-1965-9.
- \*Nie, M and E Pendall (2016). Do rhizosphere priming effects enhance plant nitrogen uptake under elevated CO<sub>2</sub>? *Agriculture Ecosystems & Environment* 224: 50-55. DOI: 10.1016/j.agee.2016.03.032.
- Ogle, K, EM Ryan, FA Dijkstra and E Pendall (2016). Quantifying and reducing uncertainties in estimated soil CO<sub>2</sub> fluxes with hierarchical data-model integration. *Journal of Geophysical Research-Biogeosciences* 121: 2935-2948. DOI: 10.1002/2016JG003385.
- Mueller, KE, DM Blumenthal, E Pendall, Y Carrillo, FA Dijkstra, DG Williams, RF Follett and JA Morgan (2016). Impacts of warming and elevated CO<sub>2</sub> on a semi-arid grassland are non-additive, shift with precipitation, and reverse over time. *Ecology Letters* 19: 956-966. DOI: 10.1111/ele.12634.
- Mueller, KE, DM Blumenthal, Y Carrillo, S Cesarz, M Ciobanu, J Hines, S Pabst, E Pendall, CM de Tomasel, DH Wall and N Eisenhauer (2016). Elevated CO<sub>2</sub> and warming shift the functional composition of soil nematode communities in a semiarid grassland. *Soil Biology & Biochemistry* 103: 46-51. DOI: 10.1016/j.soilbio.2016.08.005.
- \*Mitra, B, DS Mackay, BE Ewers and E Pendall (2016). Response of sagebrush carbon metabolism to experimental precipitation pulses. *Journal of Arid Environments* 135: 181-194. DOI: 10.1016/j.jaridenv.2016.09.005.
- Looman, A, DT Maher, E Pendall, A Bass and IR Santos (2016). The carbon dioxide evasion cycle of an intermittent first-order stream: contrasting water-air and soil-air exchange. *Biogeochemistry online first*. DOI: 10.1007/s10533-016-0289-2.
- Karan, M, et al. (2016). The Australian SuperSite Network: A continental, long-term terrestrial ecosystem observatory. *Science of the Total Environment* 568: 1263-1274. DOI: 10.1016/j.scitotenv.2016.05.170.
- Deng, Y, et al. (2016). Elevated carbon dioxide accelerates the spatial turnover of soil microbial communities. *Global Change Biology* 22: 957-964. DOI: 10.1111/gcb.13098.
- Crowther, TW, et al. (2016). Quantifying global soil carbon losses in response to warming. *Nature* 540: 104-+. DOI: 10.1038/nature20150.

- \*Carrillo, Y, FA Dijkstra, D LeCain and E Pendall (2016). Mediation of soil C decomposition by arbuscular mycorrhizal fungi in grass rhizospheres under elevated CO<sub>2</sub>. *Biogeochemistry* 127: 45-55. DOI: 10.1007/s10533-015-0159-3.
- Blumenthal, D, JA Kray, W Ortmans, LH Ziska and E Pendall (2016). Cheatgrass is favored by warming but not CO<sub>2</sub> enrichment in a semi-arid grassland. *Global Change Biology* 22: 3026-3038. DOI: 10.1111/gcb.13278.
- Bissett, A., et al. (2016). Introducing BASE: the Biomes of Australian Soil Environments soil microbial diversity database. *Gigascience* 5. DOI: 10.1186/s13742-016-0126-5.
- Beringer, J, et al. (2016). An introduction to the Australian and New Zealand flux tower network - OzFlux. *Biogeosciences* 13: 5895-5916. DOI: 10.5194/bg-13-5895-2016.
- \*Zelikova, TJ, DG Williams, R Hoenigman, DM Blumenthal, JA Morgan and E Pendall (2015). Seasonality of soil moisture mediates responses of ecosystem phenology to elevated CO<sub>2</sub> and warming in a semi-arid grassland. *Journal of Ecology* 103: 1119-1130. DOI: 10.1111/1365-2745.12440.
- Yi, C, E Pendall and P Ciais (2015). Focus on extreme events and the carbon cycle. *Environmental Research Letters* 10. DOI: 10.1088/1748-9326/10/7/070201.
- Schwendenmann, L, E Pendall, R Sanchez-Bragado, N Kunert and D Hoelscher (2015). Tree water uptake in a tropical plantation varying in tree diversity: interspecific differences, seasonal shifts and complementarity. *Ecohydrology* 8: 1-12. DOI: 10.1002/eco.1479.
- \*Ryan, EM, K Ogle, TJ Zelikova, DR LeCain, DG Williams, JA Morgan and E Pendall (2015). Antecedent moisture and temperature conditions modulate the response of ecosystem respiration to elevated CO<sub>2</sub> and warming. *Global Change Biology* 21: 2588-2602. DOI: 10.1111/gcb.12910.
- Ogle, K and E Pendall (2015). Isotope partitioning of soil respiration: A Bayesian solution to accommodate multiple sources of variability. *Journal of Geophysical Research-Biogeosciences* 120: 221-236. DOI: 10.1002/2014jg002794.
- Norton, U, BE Ewers, B \*Borkhuu, NR \*Brown and E Pendall (2015). Soil Nitrogen Five Years after Bark Beetle Infestation in Lodgepole Pine Forests. *Soil Science Society of America Journal* 79: 282-293. DOI: 10.2136/sssaj2014.05.0233.
- \*Nie, M, C Bell, MD Wallenstein and E Pendall (2015). Increased plant productivity and decreased microbial respiratory C loss by plant growth-promoting rhizobacteria under elevated CO<sub>2</sub>. *Scientific Reports* 5. DOI: 10.1038/srep09212.
- LeCain, D, D Smith, J Morgan, BA Kimball, E Pendall and F Miglietta (2015). Microclimatic Performance of a Free-Air Warming and CO<sub>2</sub> Enrichment Experiment in Windy Wyoming, USA. *Plos One* 10. DOI: 10.1371/journal.pone.0116834.
- \*Cleary, MB, \*KJ Naithani, BE Ewers and E Pendall (2015). Upscaling CO<sub>2</sub> fluxes using leaf, soil and chamber measurements across successional growth stages in a sagebrush steppe ecosystem. *Journal of Arid Environments* 121: 43-51. DOI: 10.1016/j.jaridenv.2015.05.013.
- Chen, J, \*TJ Zelikova, E Pendall, JA Morgan and DG Williams (2015). Daily and seasonal changes in soil amino acid composition in a semiarid grassland exposed to elevated CO<sub>2</sub> and warming. *Biogeochemistry* 123: 135-146. DOI: 10.1007/s10533-014-0057-0.
- Chen, J, \*Y Carrillo, E Pendall, FA Dijkstra, RD Evans, JA Morgan and DG Williams (2015). Soil Microbes Compete Strongly with Plants for Soil Inorganic and Amino Acid Nitrogen in a Semiarid Grassland Exposed to Elevated CO<sub>2</sub> and Warming. *Ecosystems* 18: 867-880. DOI: 10.1007/s10021-015-9868-7.
- \*Borkhuu, B, SD Peckham, BE Ewers, U Norton and E Pendall (2015). Does soil respiration decline following bark beetle induced forest mortality? Evidence from a lodgepole pine forest. *Agricultural and Forest Meteorology* 214: 201-207. DOI: 10.1016/j.agrformet.2015.08.258.
- \*Zelikova, TJ, DM Blumenthal, DG Williams, L Souza, DR LeCain, J Morgan and E Pendall (2014). Long-term exposure to elevated CO<sub>2</sub> enhances plant community stability by suppressing dominant plant species in a mixed-grass prairie. *Proceedings of the National Academy of Sciences of the United States of America* 111: 15456-15461. DOI: 10.1073/pnas.1414659111.
- \*Reed, DE, BE Ewers and E Pendall (2014). Impact of mountain pine beetle induced mortality on forest carbon and water fluxes. *Environmental Research Letters* 9. DOI: 10.1088/1748-9326/9/10/105004.

- \*Nie, M, E Pendall, C Bell and MD Wallenstein (2014). Soil aggregate size distribution mediates microbial climate change feedbacks. *Soil Biology & Biochemistry* 68: 357-365. DOI: 10.1016/j.soilbio.2013.10.012.
- \*Mitra, B, DS Mackay, E Pendall, BE Ewers and MB Cleary (2014). Does vegetation structure regulate the spatial structure of soil respiration within a sagebrush steppe ecosystem? *Journal of Arid Environments* 103: 1-10. DOI: 10.1016/j.jaridenv.2013.12.006.
- Ghimire, R, JB Norton and E Pendall (2014). Alfalfa-grass biomass, soil organic carbon, and total nitrogen under different management approaches in an irrigated agroecosystem. *Plant and Soil* 374: 173-184. DOI: 10.1007/s11104-013-1854-2.
- \*Carrillo, Y, FA Dijkstra, E Pendall, D LeCain and C Tucker (2014). Plant rhizosphere influence on microbial C metabolism: the role of elevated CO<sub>2</sub>, N availability and root stoichiometry. *Biogeochemistry* 117: 229-240. DOI: 10.1007/s10533-014-9954-5.
- \*Carrillo, Y, FA Dijkstra, D LeCain, JA Morgan, D Blumenthal, S Waldron and E Pendall (2014). Disentangling root responses to climate change in semiarid grassland. *Oecologia* 175: 699-711. DOI: 10.1007/s00442-014-2912-z.
- Biederman, JA, PD Brooks, AA Harpold, DJ Gochis, E Gutmann, DE Reed, E Pendall and BE Ewers (2014). Multiscale observations of snow accumulation and peak snowpack following widespread, insect-induced lodgepole pine mortality. *Ecohydrology* 7: 150-162. DOI: 10.1002/eco.1342.
- Bell, C, Y Carrillo, CM Boot, JD Rocca, E Pendall and MD Wallenstein (2014). Rhizosphere stoichiometry: are C : N : P ratios of plants, soils, and enzymes conserved at the plant species-level? *New Phytologist* 201: 505-517. DOI: 10.1111/nph.12531.
- \*Tucker, CL, \*\*J Bell, E Pendall and K Ogle (2013). Does declining carbon-use efficiency explain thermal acclimation of soil respiration with warming? *Global Change Biology* 19: 252-263. DOI: 10.1111/gcb.12036.
- Pendall, E, JL Heisler-White, DG Williams, FA Dijkstra, Y Carrillo, JA Morgan and DR LeCain (2013). Warming Reduces Carbon Losses from Grassland Exposed to Elevated Atmospheric Carbon Dioxide. *Plos One* 8. DOI: 10.1371/journal.pone.0071921.
- \*Nie, M, E Pendall, C Bell, CK Gasch, S Raut, S Tamang and MD Wallenstein (2013). Positive climate feedbacks of soil microbial communities in a semi-arid grassland. *Ecology Letters* 16: 234-241. DOI: 10.1111/ele.12034.
- \*Nie, M, M Lu, \*\*J Bell, \*\*S Raut and E Pendall (2013). Altered root traits due to elevated CO<sub>2</sub>: a meta-analysis. *Global Ecology and Biogeography* 22: 1095-1105. DOI: 10.1111/geb.12062.
- \*Naithani, KJ, BE Ewers and E Pendall (2013). Sap flux-scaled transpiration and stomatal conductance response to soil and atmospheric drought in a semi-arid sagebrush ecosystem (vol 464, pg 176, 2012). *Journal of Hydrology* 476: 496-496. DOI: 10.1016/j.jhydrol.2012.11.001.
- Dijkstra, FA, Y Carrillo, E Pendall and JA Morgan (2013). Rhizosphere priming: a nutrient perspective. *Frontiers in Microbiology* 4. DOI: 10.3389/fmicb.2013.00216.
- Blumenthal, DM, V Resco, JA Morgan, DG Williams, DR LeCain, EM Hardy, E Pendall and E Bladyka (2013). Invasive forb benefits from water savings by native plants and carbon fertilization under elevated CO<sub>2</sub> and warming. *New Phytologist* 200: 1156-1165. DOI: 10.1111/nph.12459.
- Osana, Y, A Flittner, JK Janes, P Theobald, E Pendall, PCD Newton and MJ Hovenden (2012). Decomposition and nitrogen transformation rates in a temperate grassland vary among co-occurring plant species. *Plant and Soil* 350: 365-378. DOI: 10.1007/s11104-011-0920-x.
- \*Naithani, KJ, BE Ewers and E Pendall (2012). Sap flux-scaled transpiration and stomatal conductance response to soil and atmospheric drought in a semi-arid sagebrush ecosystem. *Journal of Hydrology* 464: 176-185. DOI: 10.1016/j.jhydrol.2012.07.008.
- Edburg, SL, JA Hicke, PD Brooks, EG Pendall, BE Ewers, U Norton, D Gochis, ED Gutmann and AJH Meddens (2012). Cascading impacts of bark beetle-caused tree mortality on coupled biogeophysical and biogeochemical processes. *Frontiers in Ecology and the Environment* 10: 416-424. DOI: 10.1890/110173.
- Dijkstra, FA, E Pendall, JA Morgan, DM Blumenthal, Y Carrillo, DR LeCain, RF Follett and DG Williams (2012). Climate change alters stoichiometry of phosphorus and nitrogen in a semiarid grassland. *New Phytologist* 196: 807-815. DOI: 10.1111/j.1469-8137.2012.04349.x.

- \*Carrillo, Y, FA Dijkstra, E Pendall, JA Morgan and DM Blumenthal (2012). Controls over Soil Nitrogen Pools in a Semiarid Grassland Under Elevated CO<sub>2</sub> and Warming. *Ecosystems* 15: 761-774. DOI: 10.1007/s10021-012-9544-0.
- Brzostek, ER, JM Blair, JS Dukes, SD Frey, SE Hobbie, JM Melillo, RJ Mitchell, E Pendall, PB Reich, GR Shaver, A Stefanski, MG Tjoelker and AC Finzi (2012). The effect of experimental warming and precipitation change on proteolytic enzyme activity: positive feedbacks to nitrogen availability are not universal. *Global Change Biology* 18: 2617-2625. DOI: 10.1111/j.1365-2486.2012.02685.x.
- Pendall, E, Y Osanai, AL Williams and MJ Hovenden (2011). Soil carbon storage under simulated climate change is mediated by plant functional type. *Global Change Biology* 17: 505-514. DOI: 10.1111/j.1365-2486.2010.02296.x.
- Morgan, JA, DR LeCain, E Pendall, DM Blumenthal, BA Kimball, Y Carrillo, DG Williams, J Heisler-White, FA Dijkstra and M West (2011). C-4 grasses prosper as carbon dioxide eliminates desiccation in warmed semi-arid grassland. *Nature* 476: 202-U101. DOI: 10.1038/nature10274.
- Luo, Y, J Melillo, S Niu, C Beier, JS Clark, AT Classen, E Davidson, JS Dukes, RD Evans, CB Field, CI Czimczik, M Keller, BA Kimball, LM Kueppers, RJ Norby, SL Pelini, E Pendall, E Rastetter, J Six, M Smith, MG Tjoelker and MS Torn (2011). Coordinated approaches to quantify long-term ecosystem dynamics in response to global change. *Global Change Biology* 17: 843-854. DOI: 10.1111/j.1365-2486.2010.02265.x.
- \*Carrillo, Y, E Pendall, FA Dijkstra, JA Morgan and JM Newcomb (2011). Response of soil organic matter pools to elevated CO<sub>2</sub> and warming in a semi-arid grassland. *Plant and Soil* 347: 339-350. DOI: 10.1007/s11104-011-0853-4.
- Cable, JM, K Ogle, RW Lucas, TE Huxman, ME Loik, SD Smith, DT Tissue, BE Ewers, E Pendall, JM Welker, TN Charlet, M Cleary, A Griffith, RS Nowak, M Rogers, H Steltzer, PF Sullivan and NC van Gestel (2011). The temperature responses of soil respiration in deserts: a seven desert synthesis. *Biogeochemistry* 103: 71-90. DOI: 10.1007/s10533-010-9448-z.
- Wilske, B, H Kwon, L Wei, S Chen, N Lu, G Lin, J Xie, W Guan, E Pendall, BE Ewers and J Chen (2010). Evapotranspiration (ET) and regulating mechanisms in two semiarid Artemisia-dominated shrub steppes at opposite sides of the globe. *Journal of Arid Environments* 74: 1461-1470. DOI: 10.1016/j.jaridenv.2010.05.013.
- Pendall, E, L Schwendenmann, T Rahn, JB Miller, PP Tans and JWC White (2010). Land use and season affect fluxes of CO<sub>2</sub>, CH<sub>4</sub>, CO, N<sub>2</sub>O, H<sub>2</sub> and isotopic source signatures in Panama: evidence from nocturnal boundary layer profiles. *Global Change Biology* 16: 2721-2736. DOI: 10.1111/j.1365-2486.2010.02199.x.
- Dijkstra, FA, D Blumenthal, JA Morgan, E Pendall, Y Carrillo and RF Follett (2010). Contrasting effects of elevated CO<sub>2</sub> and warming on nitrogen cycling in a semiarid grassland. *New Phytologist* 187: 426-437. DOI: 10.1111/j.1469-8137.2010.03293.x.
- Dangi, SR, PD Stahl, E Pendall, MB Cleary and JS Buyer (2010). Recovery of soil microbial community structure after fire in a sagebrush-grassland ecosystem. *Land Degradation & Development* 21: 423-432. DOI: 10.1002/ldr.975.
- \*Cleary, MB, E Pendall and BE Ewers (2010). Aboveground and Belowground Carbon Pools After Fire in Mountain Big Sagebrush Steppe. *Rangeland Ecology & Management* 63: 187-196. DOI: 10.2111/rem-d-09-00117.1.
- \*Bachman, S, JL Heisler-White, E Pendall, DG Williams, JA Morgan and J Newcomb (2010). Elevated carbon dioxide alters impacts of precipitation pulses on ecosystem photosynthesis and respiration in a semi-arid grassland. *Oecologia* 162: 791-802. DOI: 10.1007/s00442-009-1511-x.
- Wingate, L, J Ogee, M Cuntz, B Genty, I Reiter, U Seibt, D Yakir, K Maseyk, EG Pendall, MM Barbour, B Mortazavi, R Burrell, P Peylin, J Miller, M Mencuccini, JH Shim, J Hunt and J Grace (2009). The impact of soil microorganisms on the global budget of delta O-18 in atmospheric CO<sub>2</sub>. *Proceedings of the National Academy of Sciences of the United States of America* 106: 22411-22415. DOI: 10.1073/pnas.0905210106.
- \*Shim, JH, E Pendall, JA Morgan and DS Ojima (2009). Wetting and drying cycles drive variations in the stable carbon isotope ratio of respired carbon dioxide in semi-arid grassland. *Oecologia* 160: 321-333. DOI: 10.1007/s00442-009-1302-4.

- \*Schwendenmann, L and E Pendall (2008). Response of soil organic matter dynamics to conversion from tropical forest to grassland as determined by long-term incubation. *Biology and Fertility of Soils* 44: 1053-1062. DOI: 10.1007/s00374-008-0294-2.
- Pendall, E, L Rustad and J Schimel (2008). Towards a predictive understanding of belowground process responses to climate change: have we moved any closer? *Functional Ecology* 22: 937-940. DOI: 10.1111/j.1365-2435.2008.01506.x.
- Morgan, JA, JD Derner, DG Milchunas and E Pendall (2008). Management Implications of Global Change for Great Plains Rangelands. *Rangelands* 30: 18-22. DOI: 10.2111/1551-501x(2008)30[18:miogcf]2.0.co;2.
- \*Kwon, H, E Pendall, BE Ewers, M Cleary and K Naithani (2008). Spring drought regulates summer net ecosystem CO<sub>2</sub> exchange in a sagebrush-steppe ecosystem. *Agricultural and Forest Meteorology* 148: 381-391. DOI: 10.1016/j.agrformet.2007.09.010.
- Knapp, AK, JM Briggs, SL Collins, SR Archer, MS Bret-Harte, BE Ewers, DP Peters, DR Young, GR Shaver, E Pendall and MB Cleary (2008). Shrub encroachment in North American grasslands: shifts in growth form dominance rapidly alters control of ecosystem carbon inputs. *Global Change Biology* 14: 615-623. DOI: 10.1111/j.1365-2486.2007.01512.x.
- Ewers, BE and E Pendall (2008). Spatial patterns in leaf area and plant functional type cover across chronosequences of sagebrush ecosystems. *Plant Ecology* 194: 67-83. DOI: 10.1007/s11258-007-9275-z.
- Dijkstra, FA, E Pendall, AR Mosier, JY King, DG Milchunas and JA Morgan (2008). Long-term enhancement of N availability and plant growth under elevated CO<sub>2</sub> in a semi-arid grassland. *Functional Ecology* 22: 975-982. DOI: 10.1111/j.1365-2435.2008.01398.x.
- Cuna, S, E Pendall, JB Miller, PP Tans, E Dlugokencky and JWC White (2008). Separating contributions from natural and anthropogenic sources in atmospheric methane from the Black Sea region, Romania. *Applied Geochemistry* 23: 2871-2879. DOI: 10.1016/j.apgeochem.2008.04.019.
- \*Cleary, MB, E Pendall and BE Ewers (2008). Testing sagebrush allometric relationships across three fire chronosequences in Wyoming, USA. *Journal of Arid Environments* 72: 285-301. DOI: 10.1016/j.jaridenv.2007.07.013.
- Chatterjee, A, GF Vance, E Pendall and PD Stahl (2008). Timber harvesting alters soil carbon mineralization and microbial community structure in coniferous forests. *Soil Biology & Biochemistry* 40: 1901-1907. DOI: 10.1016/j.soilbio.2008.03.018.
- Pendall, E and JY King (2007). Soil organic matter dynamics in grassland soils under elevated CO<sub>2</sub>: Insights from long-term incubations and stable isotopes. *Soil Biology & Biochemistry* 39: 2628-2639. DOI: 10.1016/j.soilbio.2007.05.016.
- \*Schwendenmann, L and E Pendall (2006). Effects of forest conversion into grassland on soil aggregate structure and carbon storage in Panama: evidence from soil carbon fractionation and stable isotopes. *Plant and Soil* 288: 217-232. DOI: 10.1007/s11104-006-9109-0.
- Pendall, E, DG Williams and SW Leavitt (2005). Comparison of measured and modeled variations in pinon pine leaf water isotopic enrichment across a summer moisture gradient. *Oecologia* 145: 605-618. DOI: 10.1007/s00442-005-0164-7.
- Del Grosso, SJ, WJ Parton, AR Mosier, EA Holland, E Pendall, DS Schimel and DS Ojima (2005). Modeling soil CO<sub>2</sub> emissions from ecosystems. *Biogeochemistry* 73: 71-91. DOI: 10.1007/s10533-004-0898-z.
- Pendall, E, AR Mosier and JA Morgan (2004). Rhizodeposition stimulated by elevated CO<sub>2</sub> in a semiarid grassland. *New Phytologist* 162: 447-458. DOI: 10.1111/j.1469-8137.2004.01054.x.
- Pendall, E, S Bridgman, PJ Hanson, B Hungate, DW Kicklighter, DW Johnson, BE Law, YQ Luo, JP Megonigal, M Olsrud, MG Ryan and SQ Wan (2004). Below-ground process responses to elevated CO<sub>2</sub> and temperature: a discussion of observations, measurement methods, and models. *New Phytologist* 162: 311-322. DOI: 10.1111/j.1469-8137.2004.01053.x.
- Pendall, E, S Del Grosso, JY King, DR LeCain, DG Milchunas, JA Morgan, AR Mosier, DS Ojima, WA Parton, PP Tans and JWC White (2003). Elevated atmospheric CO<sub>2</sub> effects and soil water feedbacks on soil respiration components in a Colorado grassland. *Global Biogeochemical Cycles* 17. DOI: 10.1029/2001gb001821.

- Mosier, AR, E Pendall and JA Morgan (2003). Effect of water addition and nitrogen fertilization on the fluxes of CH<sub>4</sub>, CO<sub>2</sub>, NO<sub>x</sub>, and N<sub>2</sub>O following five years of elevated CO<sub>2</sub> in the Colorado Shortgrass Steppe. *Atmospheric Chemistry and Physics* 3: 1703-1708. DOI.
- \*Ferretti, DF, E Pendall, JA Morgan, JA Nelson, D LeCain and AR Mosier (2003). Partitioning evapotranspiration fluxes from a Colorado grassland using stable isotopes: Seasonal variations and ecosystem implications of elevated atmospheric CO<sub>2</sub>. *Plant and Soil* 254: 291-303. DOI: 10.1023/a:1025511618571.
- Pendall, E, V Markgraf, JWC White, M Dreier and R Kenny (2001). Multiproxy record of late Pleistocene-Holocene climate and vegetation changes from a peat bog in Patagonia. *Quaternary Research* 55: 168-178. DOI: 10.1006/qres.2000.2206.
- Pendall, E, SW Leavitt, T Brooks, BA Kimball, PJ Pinter, GW Wall, RL LaMorte, G Wechsung, F Wechsung, F Adamsen, AD Matthias and TL Thompson (2001). Elevated CO<sub>2</sub> stimulates soil respiration in a FACE wheat field. *Basic and Applied Ecology* 2: 193-201. DOI: 10.1078/1439-1791-00053.
- Leavitt, SW, E Pendall, EA Paul, T Brooks, BA Kimball, PJ Pinter, HB Johnson, A Matthias, GW Wall and RL LaMorte (2001). Stable-carbon isotopes and soil organic carbon in wheat under CO<sub>2</sub> enrichment. *New Phytologist* 150: 305-314. DOI: 10.1046/j.1469-8137.2001.00113.x.
- Pendall, E (2000). Influence of precipitation seasonality on pinon pine cellulose delta D values. *Global Change Biology* 6: 287-301. DOI: 10.1046/j.1365-2486.2000.00304.x.

### **Lead Author Presentations, Last Five Years**

2016. Pendall E (Invited). What are the carbon costs for nutrient uptake? Awesome P Workshop, Oak Ridge Tennessee.
2016. Pendall E (Invited), Blumenthal DM, Carrillo Y, Dijkstra FA, Mueller KE, Nelson L, Nie M, Ogle K, Ryan E, Samuels-Crow KE, Williams DG, Zelikova TJ. Interactive Effects of Experimental Warming and Elevated CO<sub>2</sub> on Belowground Allocation and Soil Organic Matter Decomposition at the Prairie Heating and CO<sub>2</sub> Enrichment Experiment. American Geophysical Union Fall Meeting 2016, San Francisco, CA.
2016. Pendall E, Flanagan LB, Liu S, DelGrosso S, El Masri B, Liu JX, Conant RT, Schaeffer SM. Resilience and Vulnerability of Carbon Cycling in North American Grasslands. American Geophysical Union Fall Meeting 2016, San Francisco, CA.
2015. Pendall, E. (Invited seminar), Root Mediation of Soil Organic Matter Stability with Climate Change. Sydney EcoPhysiology Group, University of Technology Sydney.
2015. Pendall, E. (Invited seminar), Unexpected carbon cycle – climate feedbacks: the importance of rhizosphere mechanisms. Macquarie University, Sydney.
2015. Pendall E, (Invited), Resco de Dios V, Cleverly JR, Issac PR, Renchon A, Barton CVM, Boer MM, Tissue D, Maier C. What Drives the Phenology of Carbon Exchange in an Australian Temperate Woodland? American Geophysical Union Fall Meeting 2015, San Francisco, CA.
2014. Pendall E, Carrillo Y, Nie M, Osanai Y, Nelson L, Sanderman J, Hovenden M, Baldock J. Root Mediation of Soil Organic Matter Feedbacks to Climate Change. American Geophysical Union Fall Meeting 2014, San Francisco, CA. 2014.
2014. Pendall E, Sanderman J, Baldock J, Hovenden M. Soil Organic C Storage Under Elevated CO<sub>2</sub> is Dependent on Plant Species: A Role for C Quality? Goldschmidt Geochemistry Conference, Sacramento, CA, June 2014.
2013. Elise Pendall, (Invited seminar), Terrestrial ecosystem feedbacks to climate change: Example from Wyoming grassland. Department of Geology, Stockholm University, Sweden. 23 Jan 2013.
2013. Elise Pendall, (Invited seminar), Unexpected carbon cycle – climate feedbacks: the importance of rhizosphere mechanisms. University of Western Sydney, Australia. 30 May 2013.
2013. Pendall E and Nie, M. Altered precipitation dampens ecosystem C sequestration. American Geophysical Union Fall Meeting 2013, San Francisco, CA. 2013.

### **STUDENT & POSTDOC SUPERVISION**

#### Postdoctoral researchers



I have supervised 10 postdoctoral researchers since 2003 (one current), 6 of whom were women, and 5 of whom were non-native English speakers. I take mentoring postdocs very seriously and endeavor to provide them with career advice and opportunities, including teaching and supervising graduate and undergraduate students. I have supervised 9 Ph.D. students (4 current), 7 of whom were women and 6 of whom were non-native English speakers. I have also supervised 7 M.S. students, 1 of whom was male; I supported numerous undergraduate researchers in my laboratory in Wyoming, and 10 of those went on to conduct independent research projects.

### **PROFESSIONAL AFFILIATIONS AND ACTIVITIES**

Member of American Geophysical Union, Soil Science Society of America, Soil Science Australia, Ecological Society of America

National Center for Ecological Analysis and Synthesis (NCEAS) Science Advisory Board, 2009-2012.

Affiliate Appointment, Science and Math Teaching Center (SMTC), University of Wyoming 2005-2014.

Affiliate Faculty Member, Department of Forest, Rangeland and Watershed Stewardship, Colorado State University, 2003-2008; 2015-present.

#### Grant Refereeing

Australian Research Council Discovery Program

Chilean National Science and Technology Commission

Research Foundation – Flanders (Belgium)

New Zealand Ministry of Business, Innovation and Employment

Netherlands Organization for Scientific Research (NWO)

U.S. National Science Foundation

National Institute for Global Environmental Change (Dept. of Energy)

Petroleum Research Fund

Kearney Foundation for Soil Science

United Kingdom – Natural Environment Research Council

Wyoming NASA Space Grant Foundation

National Institute for Climatic Change Research

Univ. Wyoming Agricultural Experiment Station Competitive Grant Program

#### Proposal Panel Memberships

New Zealand Ministry of Business, Innovation and Employment, Lead Assessor

USDA Managed Ecosystems Panel

UW Agricultural Experiment Station Panels

NSF Carbon and Water in the Earth System; Coupled Natural Human Systems

NASA/USDA LAM Panel

#### Journal Editing

Ecosystems, 2017-present.

Journal of Geophysical Research – Biogeosciences, Associate Editor, 2013-present.

Biogeosciences (European Geophysical Union Journal), Associate Editor, 2013-2017.

PLOS ONE, Academic Editor, 2013 – 2015.

Global Change Biology Editorial Advisory Board, 2011-2015

Environmental Research Letters, Special Issue on Extreme Events and Carbon Cycle, 2012-2013.

Functional Ecology, Guest Editor, Special Feature on Belowground Responses to Global Change, 2008.

Manuscript Refereeing

Nature, Proceedings of the National Academy of Sciences, Ecological Applications, Journal of Ecology, Ecology, Climatic Change, Biogeosciences, GSA Bulletin, Quaternary Research, Oecologia, Soil Science Society of America Journal, Soil Biology and Biochemistry, Organic Geochemistry, Global Biogeochemical Cycles, Journal of the American Water Resources Association, Ecology, Geochimica et Cosmochimica Acta, Applied Geochemistry, Plant, Cell and Environment, New Phytologist, Global Change Biology, Journal of Geophysical Research-Biogeoscience, Scientia Agricola, Journal of Plant Ecology, Forest Ecology and Management, Plant and Soil, Rapid Communications in Mass Spectrometry.