

Elise Pendall

Professor of Soil Science
Theme Leader, Soil Biology & Genomics
Hawkesbury Institute for the Environment
Western Sydney University
Locked Bag 1797, Penrith NSW 2751 Australia
Email: e.pendall@westernsydney.edu.au

RESEARCH INTERESTS

I study responses of biogeochemical cycling to climate change, ecological disturbances and land management; I apply stable isotope techniques to uncover mechanisms regulating these processes. I have particular interests in plant-soil-microbe interactions in the rhizosphere. Recently I have focused on linkages between aboveground and belowground ecosystem components and how they regulate carbon, water and nutrient cycling in grasslands, forests and crops.

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

SYNERGISTIC ACTIVITIES & LEADERSHIP

American Geophysical Union Biogeosciences Section President-Elect, 2017-2018; President, 2019-2020.
American Geophysical Union Ethics Task Force member, 2016-2017.
US Global Change Research Program, Second State of the Carbon Cycle Report (SOCCR2) Lead author, 2016-present.
Theme Leader, Soil Biology and Genomics, Western Sydney University, 2015-present.
National Ctr. for Ecological Analysis & Synthesis (NCEAS) Science Advisory Board, 2009-2012.

RECENT PUBLICATIONS (*students or postdocs)

Samuels-Crow KE, *Ryan E, Pendall E, Ogle K. (2018). Temporal coupling of subsurface and surface soil CO₂ fluxes: Insights from a non-steady state model and cross-wavelet coherence analysis. Accepted at Journal of Geophysical Research, Biogeosciences.

*Ryan E, Ogle K, Kropp H, Samuels-Crow KE, *Carrillo Y, Pendall E. (2018). Modelling soil CO₂ production and transport with dynamic source and diffusion terms: Testing the steady-state assumption using DETECT v1.0. Accepted at Geophysical Model Development.

Dijkstra FA, Carrillo Y, Blumenthal DM, Mueller KE, LeCain DR, Morgan JA, Zelikova TJ, Williams DG, Follett RF, Pendall E. (2018). Elevated CO₂ and water addition enhance nitrogen turnover in grassland plants with implications for temporal stability. Accepted at Ecology Letters.

Mueller KE, LeCain DR, McCormack ML, Pendall E, Carlson M, Blumenthal DM. (2018). Root responses to climate change and irrigation in a semiarid grassland: integrating biomass, length, and lifespan in a 5-year field experiment. Accepted at Journal of Ecology.

Van Gestel N, Shi Z, van Groenigen KJ, Osenberg CW, Andresen LC, Dukes JS, Hovenden MJ, Luo Y, Michelsen A, Pendall E, Reich PB, Schuur EAG, Hungate BA. Predicting soil carbon loss with warming. Nature 554, E4-E5. doi:10.1038/nature25745. (Brief communication arising).

*Mitra B, Mackay DS, Ewers BE, Pendall E. (2018). Model – Data fusion approach to quantify evapotranspiration and net ecosystem exchange across the sagebrush ecosystem at different temporal resolutions. In press, Ecohydrology.

- Pinero J, Ochoa-Hueso R, Delgado-Baquerizo M, Dobrick S, Reich PB, Pendall E, Power SA. (2017). Effects of elevated CO₂ on fine root biomass are reduced by aridity but enhanced by soil nitrogen: A global meta-analysis. *Scientific Reports* v 7. DOI 10.1038/s41598-017-15728-4.
- Reed DE, Ewers BE, Pendall E, Naithani KJ, Kwon H, Kelly RD. (2018). Biophysical factors and canopy coupling control ecosystem fluxes of semi-arid sagebrush ecosystems. In press, *Rangeland Ecology and Management*.
- Blumenthal DM, Mueller KE, Kray JA, LeCain DR, Pendall E, Duke S, *Zelikova TJ, Dijkstra FA, Williams DG, Morgan JA. (2018). Warming and elevated CO₂ interact to shift timing and reduce variability of soil water in a semi-arid grassland. In press, *Ecosystems*.
- Suseela V, Tharayil N, Pendall E, Rao A. (2017). Warming and elevated CO₂ alter the suberin chemistry in roots of photosynthetically divergent grass species. In press, *Annals of Botany*.
- *Nelson LA, Blumenthal DM, Williams DG, Pendall E. (2017). Digging into the roots of belowground carbon cycling following seven years of Prairie Heating and CO₂ Enrichment (PHACE), Wyoming USA. *Soil Biology and Biochemistry* 115: 169-177.
- *Griebel A, Watson D, Pendall E. (2017). Mistletoe, friend and foe: Synthesizing ecosystem implications of mistletoe infection. *Environmental Research Letters* 12: 115012.
- Hortal-Botifol S, Plett KL, Cresswell T, Johansen M, Pendall E, Anderson IC. (2017). Role of plant-fungal nutrient trading and host control in determining the competitive success of ectomycorrhizal fungi. *ISME Journal* 11:2666-2676.
- Van Groenigen KJ, Osenberg C, Terrer C, Carrillo Y, Dijkstra FA, Heath J, Nie M, Pendall E, Phillips R, Hungate B. (2017). Faster turnover of new soil carbon inputs under increased atmospheric CO₂. *Global Change Biology* 23: 4420-4429. DOI: 10.1111/gcb.13752
- *Sorokin Y, *Zelikova TJ, Blumenthal D, Williams DG, Pendall E. (2017). 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 CO₂ Enrichment experiment. *Global Change Biology* 23: 3623-3645. DOI: 10.1111/gcb.13643.

CURRENT CONTRACTS & GRANTS

- 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.
- 2018-2020. 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. \$480,000.
- 2017-2020. S Power, I Anderson, N Rakesh, B Singh, M Tjoelker, E Pendall, D Tissue, J Powell, C Macdonald, Y Carrillo, B Moore, J Plett. Sustainable Pastures and Climate Extremes (PACE). Supported by Meat and Livestock Association and Dairy Australia. \$1,900,000.
- 2017-2018. Carrillo Y, Macdonald C, Pendall E. Improving soil functional health to reduce greenhouse gas emissions in systems using liquid fertilizer. Wilmar Bioethanol. \$45,000.
- 2016-2018. Boer M, Pendall E. Terrestrial Ecosystem Research Network: Cumberland Plain SuperSite \$150,000.

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

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

Associate Editor: *Journal of Geophysical Research – Biogeosciences*; *Ecosystems*