

# RACHEL C. WOOLIVER

University of Tennessee  
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## EXPERIENCE, SKILLS, AND QUALIFICATIONS

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- Ph.D. in Ecology & Evolutionary Biology.
- Four years of research experience in soil biogeochemical processes in agricultural systems with peer-reviewed publications.
- Expertise in statistical analysis of soil biogeochemical properties and microbial communities using R statistical software.
- Strong experience in written and oral communication.
- Background in training students in laboratory- and field-based research protocols.
- Skilled in operating and maintaining analytical instruments involved in measuring concentration and isotopic signature of carbon.

## PROFESSIONAL APPOINTMENTS

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- Research Scientist** *2023-present*  
University of Tennessee, Knoxville  
Department of Biosystems Engineering & Soil Science  
Area of Research: Carbon-plant-microbial interactions for soil health and agroecosystem sustainability
- Postdoctoral Research Associate** *2020-2023*  
University of Tennessee, Knoxville  
Department of Biosystems Engineering & Soil Science  
Advisor: Dr. Sindhu Jagadamma  
Project: Optimizing plant-soil-microbial interactions through crop diversification
- Postdoctoral Research Associate** *2018-2020*  
North Carolina State University  
Department of Plant & Microbial Biology  
Advisor: Dr. Seema Sheth  
Project: Evolutionary responses to climate change in the scarlet monkeyflower

## EDUCATION

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- Ph.D., Ecology & Evolutionary Biology** *2013-2018*  
University of Tennessee, Knoxville  
Advisor: Dr. Jennifer Schweitzer; co-advised by Dr. Brian O'Meara, Dr. Joseph Bailey, and Dr. Henri Grissino-Mayer  
Project: Ecology and evolution of plant nitrogen limitation
- B.S., Ecology & Evolutionary Biology w/Geography minor** *2009-2013*  
University of Tennessee, Knoxville

## PUBLICATIONS

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16. **Wooliver R**, Jagadamma S (2023). Response of soil organic carbon fractions to cover cropping: A meta-analysis of agroecosystems. *Agriculture, Ecosystems and Environment*, 351, 108497.
15. **Wooliver R**, Kivlin SN, Jagadamma S (2022). Links among crop diversification, microbial diversity, and soil organic carbon: Mini review and case studies. *Frontiers in Microbiology*, 13, 854247.
14. Coughlin AO, **Wooliver R**, Sheth SN (2022). Populations of western North American monkeyflowers accrue niche breadth primarily via genotypic divergence in environmental optima. *Ecology and Evolution*, 12, e9434.
13. **Wooliver R**, Vtipilthorpe E, Weigmann A, Sheth SN (2022). A viewpoint on ecological and evolutionary study of plant thermal performance curves in a warming world. *AoB Plants*, plac016, <https://doi.org/10.1093/aobpla/plac016>.
12. Querns A, **Wooliver R**, Vallejo-Marn M, Sheth SN (2022). The evolution of thermal performance in native and invasive populations of *Mimulus guttatus*. *Evolution Letters*, 6, 136-148.
11. Preston J, **Wooliver R**, Driscoll H, Coughlin A, Sheth SN (2022). Spatial variation in high temperature-regulated gene expression predicts evolution of plasticity with climate change in the scarlet monkeyflower. *Molecular Ecology*, 31, 1254-1268.
10. **Wooliver R**, Tittes SB, Sheth SN (2020). A resurrection study reveals limited evolution of thermal performance in response to recent climate change across the geographic range of the scarlet monkeyflower. *Evolution*, 74, 1699-1710.
9. Ware I, Fitzpatrick C, Senthilnathan A, Bayliss S, Beals K, Mueller L, Summers J, **Wooliver R**, Van Nuland M, Kinnison MT, Palkovacs E, Schweitzer J, Bailey JK (2019). Feedbacks link ecosystem ecology and evolution across spatial and temporal scales: Empirical evidence and future directions. *Functional Ecology*, 33, 31-42.
8. **Wooliver R**, Pellegrini AFA, Waring BG, Houlton BZ, Averill C, Schimel J, Hedin LO, Bailey JK, Schweitzer JA (2019). Changing perspectives on terrestrial nitrogen cycling: the importance of weathering and evolved resource-use traits for understanding ecosystem responses to global change. *Functional Ecology*, 33, 1818-1829.
7. **Wooliver R**, Senior JK, Potts B, Van Nuland ME, Bailey JK, Schweitzer JA (2018). Soil fungi underlie a phylogenetic pattern in plant growth responses to nitrogen enrichment. *Journal of Ecology*, 106, 2161-2175. [Editor's choice]
6. Senior JK, O'Reilly-Wapstra JM, Potts BM, **Wooliver R**, Bissett A, Bailey JK, Glen M, Schweitzer JA (2018). Phylogenetic trait conservatism predicts patterns of plant-soil feedback. *Ecosphere*, 9, e02409.
5. **Wooliver R**, Marion Z, Peterson CR, Potts B, Senior JK, Bailey JK, Schweitzer JA (2017). Phylogeny is a powerful tool for predicting plant biomass responses to nitrogen enrichment. *Ecology*, 98, 2120-2132.

4. Van Nuland ME, **Wooliver R**, Pfennigwerth A, Read Q, Ware IM, Mueller L, Fordyce J, Schweitzer JA, Bailey JK (2016). Plant-soil feedbacks: connecting ecosystem ecology and evolution. *Functional Ecology*, 30, 1032-1042.
3. **Wooliver R**, Pfennigwerth A, Schweitzer JA, Bailey JK (2016). Plant functional constraints guide macroevolutionary trade-offs in competitive and conservative growth responses to nitrogen. *Functional Ecology*, 30, 1099-1108.
2. Senior JK, Potts BM, Davies N, **Wooliver R**, Schweitzer JA, Bailey JK, O'Reilly-Wapstra JM (2016). Phylogeny explains variation in the root chemistry of *Eucalyptus* species. *Journal of Chemical Ecology*, 42, 1086-1097.
1. **Wooliver R**, Senior JK, Schweitzer JA, O'Reilly-Wapstra JM, Langley JA, Chapman SK, Bailey JK (2014). Evolutionary history and novel biotic interactions determine plant responses to CO<sub>2</sub> and nitrogen fertilization. *PLOS ONE* 9(12): e114596.

## SCIENTIFIC PRESENTATIONS

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Wooliver R, Kivlin S, Lee J, Jagadamma S (2023). "Can diverse cover crop mixtures improve weed suppression, row crop yield, and soil health in the southeastern United States?" ASA-CSSA-SSSA International Annual Meeting.

Wooliver R, Kivlin SN, McClure A, Lee J, Jagadamma S (2022). "Soil microbial communities, soil carbon, and crop yields after two years of crop diversification in Tennessee." ASA-CSA-SSSA International Annual Meeting [Poster].

Wooliver R, Kivlin S, McClure A, Jagadamma S (2021). "Outcomes of crop diversification for soil microbial communities, soil health, and crop yields in west Tennessee." ASA-CSSA-SSSA International Annual Meeting.

Wooliver R, Vtipil E, Sheth SN (2020). "A call for unified study of plant thermal performance in a warming world." Virtual Botany.

Wooliver R, Tittes S, Sheth SN (2019). "Can plant thermal tolerance evolve under climate change? A comparison of central and edge populations." Southeastern Population Ecology & Evolutionary Genetics Conference.

Wooliver R, Tittes S, Sheth SN (2019). "Can plant thermal tolerance evolve under climate change? A comparison of central and edge populations." International Biogeography Society, Humboldt 250 Meeting in Quito, Ecuador. (*Symposium: "Architects of variation: How climate and physiology shape patterns of biodiversity"*)

Wooliver R (2019). "New insights in the ecology and evolution of plant nitrogen limitation." North Carolina State University, Plant & Microbial Biology Seminar Series.

Wooliver R (2019). "New insights in the ecology and evolution of plant nitrogen limitation." Duke University, Population Biology Seminar Series.

Wooliver R (2018). "New insights in the ecology and evolution of plant nitrogen limitation." UTK, Ecology & Evolutionary Biology Seminar Series.

Wooliver R, Pfennigwerth A, Peterson CR, Marion Z, Potts B, Senior JK, Bailey JK, Schweitzer JA (2017). "Phylogeny and soil fungi explain tradeoffs in plant growth responses to

nitrogen enrichment.” Ecological Society of America. (*Symposium: “Nitrogen in terrestrial ecosystems: New paradigms”, organized by Wooliver R & Schweitzer JA*)

Wooliver R, Pfennigwerth A, Bailey JK, Schweitzer JA (2016). “Plant functional constraints guide macroevolutionary trade-offs in competitive and conservative growth responses to nitrogen.” Ecological Society of America.

Wooliver R, Bailey JK, Schweitzer JA (2015). “Effects of phylogeny and functional traits on plant responses to nitrogen enrichment.” University of Tasmania, School of Biological Sciences Seminar Series.

Wooliver R, Bailey JK, Schweitzer JA (2014). “Plant responses to global change through the lens of evolutionary history.” University of Kentucky, Spring Symposium in Ecology, Evolution & Behavior.

## SERVICE & TRAINING

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Research Tour Contributor at Milan No-Till Field Day. ”Impacts of cover crop mixtures on weeds and soil health” [Recorded talk] 2022  
Exhibitor in the North Carolina Museum of Natural Science Darwin Day event 2019  
Attendee of Ridge 2 Reef: Microbiomes & Global Change Summer Institute 2019  
Manuscript reviewer for *Agriculture, Ecosystems, and Environment*, *American Naturalist*, *Biogeochemistry*, *Current Biology*, *Ecology*, *Ecology and Evolution*, *Ecoscience*, *Frontiers in Ecology and Evolution*, *Functional Ecology*, *Journal of Ecology*, *New Phytologist*, & *Soil Biology and Biogeochemistry* 2016-present  
Mentorship: Providing guidance for undergraduate and graduate students 2016-present  
UTK Ecology & Evolutionary Biology Seminar Committee 2016-2017  
UTK Darwin Day Advertising Committee 2016  
Guest co-author for British Ecological Society Plants-Soils-Ecosystems Journal Club: “*Looking back to move forward: evolutionary history and plant-soil feedbacks*” 2014  
Science Olympiad State Tournament & Boo at the Zoo volunteer 2014-2015

## GRANTS & AWARDS

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UTIA Genomics Center or the Advancement of Agriculture Sequencing Grant: \$5,000 2023  
NCSU Postdoctoral Professional Development Award: \$1,000 2020  
Nominated for the Jimmy & Ileen Cheek Medal of Excellence 2018  
Cokkinias Graduate Fellowship, UTK Division of Biology: \$1,000 2017  
Excellence in Research Award, UTK Graduate Student Senate 2017  
Alexander Hollaender Graduate Fellowship: \$6,000 2016  
Francis & Evelyn Clark Soil Biology Scholarship: \$2,000 2016  
Ecological Society of America Soil Ecology Travel Award: \$500 2016  
UTK Graduate Student Senate Travel Award: \$1,565 2016 & 2017  
East Asia & Pacific Summer Institute Fellowship, National Science Foundation: \$5,000 2015  
EEB Outstanding Publication by a Graduate Student Award 2015 & 2017  
UTK Chancellors Funds: \$5,333 2014-2018  
Departmental Research Grant: \$3,402 2014-2015

## TEACHING

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Graduate Teaching Assistant at UTK (Courses taught: Ecology field-based lab, Ecology lecture, Biology lab, Biology literature) *2013-2018*  
Guest lecturer for undergraduate Ecology course at UTK *2015-2018*  
Member of Curriculum Reform Committee for Biology courses at UTK *2014*