

Andrea Jilling

Assistant Professor • Environmental Soil Science

Department of Environmental Health Sciences
Arnold School of Public Health
University of South Carolina
Columbia, SC 29208
Email: ajilling@mailbox.sc.edu

EDUCATION

2013–2019 Ph.D., Earth and Environmental Science, University of New Hampshire
2016 Stable Isotope Ecology Course, University of Utah
2006–2011 B.Sc. Agricultural and Environmental Science, McGill University

RESEARCH AND PROFESSIONAL EXPERIENCE

2023–present Assistant Professor of Environmental Soil Science, University of South Carolina
2019–2023 Assistant Professor of Environmental Soil Chemistry, Oklahoma State University
2018–2019 Dissertation Year Fellow, Graduate School, University of New Hampshire
2014–2019 National Science Foundation Graduate Research Fellow, Advisor: Dr. Stuart Grandy, University of New Hampshire
2013–2014 Graduate Research Assistant, Advisor: Dr. Stuart Grandy, University of New Hampshire
2011 Assistant Head Grower and Manager, Lufa Farms, Montreal, Quebec

PUBLICATIONS

Herzog, C., Reeves, J.T., Ipek, Y., **Jilling, A.**, Hawlena, D., and Wilder, S.M., 2023. Multi-elemental consumer-driven nutrient cycling when predators feed on different prey. *Oecologia*, 1-14.

Grandy, A.S., Daly, A.B., Bowles, T.M., Gaudin, A.C., **Jilling, A.**, Leptin, A., McDaniel, M.D., Wade, J. and Waterhouse, H., 2022. The nitrogen gap in soil health concepts and fertility measurements. *Soil Biology and Biochemistry*, p.108856.

Sokol, N.W., Whalen, E.D., **Jilling, A.**, Kallenbach, C., Pett-Ridge, J. and Georgiou, K., 2022. Global distribution, formation and fate of mineral-associated soil organic matter under a changing climate: A trait-based perspective. *Functional Ecology*

Bowles, T., Moran Rivera, K., **Jilling, A.**, Schneckler, Jorg, and Grandy, A.S. 2022. Crop rotational diversity affects plant-soil nitrogen cycling during water deficit. *Soil Biology & Biochemistry*.

Cates, A., **Jilling, A.**, Tfaily, M., Jackson, R.D., 2022. Temperature and moisture alter organic matter composition across soil fractions. *Geoderma*.

Daly, A., **Jilling, A.**, Bowles, T.M., Buchkowski, R.W., Frey, S.D., Kallenbach, C.M., Keiluweit, M., Mooshammer, M., Schimel, J.P., Grandy, A.S., 2021 A holistic framework integrating plant-microbe regulation of soil bioavailable nitrogen. *Biogeochemistry*, 154: 211-229.

Jilling, A., Keiluweit, M, Gutknecht, J., Grandy, A.S. 2021. Priming mechanisms providing plants and microbes access to mineral-associated organic matter. *Soil Biology and Biochemistry*, 108265

Waring, B.G., Sulman, B.N., Reed, S., Smith, A.P., Averill, C., Creamer, C.A., Cusack, D.F., Hall, S.J., Jastrow, J.D., **Jilling, A.** and Kemner, K.M., 2020. From pools to flow: The PROMISE framework for new insights on soil carbon cycling in a changing world. *Global Change Biology*, 6(12): 6631-6643

Jilling, A., Kane, D.A., Williams, A., Yannarell, A.C., Davis, A., Jordan, N.R., Koide, R., Mortensen, D., Smith, R.G., Snapp, S.S., Spokas, K.A., Grandy, A.S. 2020. Rapid and distinct

responses of particulate and mineral-associated organic nitrogen to conservation tillage and cover crops. *Geoderma*, 359, 114001.

Crowley, M.A., Shannon, K.E., Leslie, I.S., **Jilling, A.**, McIntire, C.D., Kyker-Snowman, E. 2018. Sustainable beef production in New England: policy and value-chain challenges and opportunities. *Agroecology and Sustainable Food Systems*, 1-25.

Jilling, A., Keiluweit, M., Contosta, A.R., Frey, S., Schimel, J., Schneckner, J., Smith, R., Tiemann, L., Grandy, A.S. 2018. Minerals in the rhizosphere: overlooked mediators of soil nitrogen availability to plants and microbes. *Biogeochemistry*, Synthesis and Emerging Ideas Section, 139(2):103-122.

Williams, A., Davis, A.S., **Jilling, A.**, Grandy, A.S., Koide, R.T., Mortenson, D.A., Smith, R.G., Snapp, S.S., Spokas, K.A., Yannarell, A.C., Jordan, N.R., 2017. Reconciling opposing soil processes in row-crop agroecosystems via soil functional zone management. *Agriculture, Ecosystems and Environment*, 236:99-107.

Williams, A., Kane, D.A., Ewing, P.M., Atwood, L.W., **Jilling, A.**, Li, M., Lou, Y., Davis, A.S., Grandy, A.S., Huerd, S.C. and Hunter, M.C., 2016. Soil functional zone management: a vehicle for enhancing production and soil ecosystem services in row-crop agroecosystems. *Frontiers in Plant Science*, 7(65).

PRESENTATIONS

INVITED PRESENTATIONS

Jilling, A. Potential consequences and unknown benefits of sugar applications to soil. Winter Crops School, Oklahoma State University, December 14, 2022. *Oral Presentation*.

Jilling, A. Controls on the formation and bioavailability of mineral-associated organic matter. Keynote presentation for the annual meeting of the Soil Ecology Society, May 18, 2022. *Oral Presentation*.

Jilling, A. Scaling from molecule to ecosystem to understand the function and agronomic relevance of soil organic matter. Environmental Graduate Seminar, School of Civil and Environmental Engineering, Oklahoma State University, March 24, 2022. *Oral Presentation*.

Jilling, A. Assessing the ecological relevance of mineral-associated organic matter. Invited seminar at the Noble Research Institute, Ardmore, OK, February 20, 2020. *Oral Presentation*.

Jilling, A., Sokol, N., Moran Rivera, K., and Grandy, S. Soil moisture variations affect the chemical and biological stability of mineral-associated organic matter. Annual meeting for the American Geophysical Union, virtual, December 16, 2020. *Poster Presentation*.

Jilling, A., Sokol, N., Moran Rivera, K., and Grandy, S. Soil moisture variations alter the chemical and biological stability of mineral-associated organic matter. Annual meeting for the American Society of Agronomy, Crop Science Society of America, and the Soil Science Society of America, virtual, November 9-13, 2020. *Oral Presentation*.

Jilling, A. Assessing the ecological relevance of mineral-associated organic matter. Invited seminar at the Noble Research Institute, Ardmore, OK, February 20, 2020. *Oral Presentation*.

Jilling, A. Clay minerals: overlooked purveyors of soil nitrogen. Ecological Society of America Conference, New Orleans, LA, August 5-10, 2018. *Oral Presentation*

CONTRIBUTED PRESENTATIONS

Jilling, A., Sokol, N., Moran Rivera, K., and Grandy, S. Soil moisture variations affect the chemical and biological stability of mineral-associated organic matter. Annual meeting for the American Society of Agronomy, Crop Science Society of America, and the Soil Science Society of America, San Antonio, TX, November 10-13, 2019. *Poster Presentation*.

Jilling, A., Keiluweit, M., and A.S. Grandy. Priming mechanisms providing plants and microbes access to mineral-associated organic nitrogen. Ecological Society of America Conference, New Orleans, LA, August 5-10, 2018. *Oral Presentation*.

- Jilling, A. Unlocking a hidden source of nitrogen in agricultural soils. Three Minute Thesis Competition, University of New Hampshire, April 24, 2018. *Oral Presentation.*
- Jilling, A., Keiluweit, M., and A.S. Grandy. The potential bioavailability of mineral-associated organic nitrogen in the rhizosphere. American Geophysical Union Conference, New Orleans, LA, December 12-17, 2017. *Poster Presentation.*
- Jilling, A., Keiluweit, M., Contosta, A.R., Frey, S., Schimel, J., Schnecker, J., Smith, R., Tiemann, L. and A.S. Grandy. Mineral-associated organic matter: a hidden source of nitrogen in agricultural soils? Soil Science Society of America Conference, Tampa, FL, November 6-9, 2017. *Oral Presentation.*
- Jilling, A. and A.S. Grandy. Clay Minerals: Critical Mediators of Nitrogen Availability in the Rhizosphere. SOMMIC: Microbial Contribution and Impact on Soil Organic Matter, Structure, and Genesis, Leipzig, Germany, November 9-11, 2016. *Poster Presentation.*
- Jilling, A., and A.S. Grandy. Organic matter distribution across particulate and mineral-associated fractions varies directly and interactively with cover cropping and tillage management. Graduate Research Conference, University of New Hampshire, April 12, 2016. *Oral Presentation.*
- Jilling, A. and A.S. Grandy. Organic matter distribution across particulate and mineral-associated fractions varies with soil type and management. 5th International Symposium on Soil Organic Matter, Göttingen, Germany, September 20-24, 2015. *Oral Presentation.*
- Jilling, A. and A.S. Grandy. Organic Matter Distribution Across Particulate and Mineral-Associated Fractions Varies Directly and Interactively with Cover Cropping and Tillage Management. Soil Interfaces for Sustainable Development Conference, Joint Meeting of ISMOM-CSSS-AQSSS, Montreal, Quebec, July 5-10, 2015. *Oral Presentation.*
- Jilling, A. and A.S. Grandy, Mineralogical Control Over Nitrogen Mineralization in Agricultural Soils. The Sixth International Workshop on Soil and Sedimentary Organic Matter Stabilization and Destabilization (SOM6), Kiawah Island, SC, October 5-9, 2014. *Poster Presentation.*
- Jilling, A., L.G. Umek, and L. Egerton-Warburton. Divergent soil microbial community recovery in response to contrasting restoration techniques targeted against an invasive species. Ecological Society of America Annual Meeting, August 2-9, 2009. *Poster Presentation.*

AWARDS AND ACHIEVEMENTS

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| 2021 | Early Career Achievement Award, Soil Ecology Society
<i>Given to an early career soil ecologist within 5 years of earning their PhD who demonstrates potential to continue making outstanding research contributions to the field of soil ecology.</i> |
| 2019 | Elizabeth Sulzman Award - Junior Scientist Outstanding Publication Award, Ecological Society of America, Biogeosciences Section |

GRANTS

Jilling, A. (PI) 11/1/2021–2/28/2022. Career-Life Balance Supplemental Funding. Funding for support staff to maintain research activities during maternity leave. National Science Foundation, Ecosystem Science Program (\$30,002)

Wade, J., Margenot, A., and **Jilling, A (Co-PI)**. 3/2022-2/2025. Soil mineralogy and N synchrony: quantifying contextual linkages between soil health and crop N availability. USDA NIFA, Foundational Program: Microbial Communities in Soil (\$499,613 total; \$36,391 to Jillings)

Jilling, A. (PI) 9/1/2021-8/15/2023. Examining the role of plant-soil interactions and geochemistry in mediating soil health outcomes. Project funded by General Mills and coordinated in collaboration with Oklahoma Conservation Commission (\$135,000)

Jilling, A. (PI), 6/2021-6/2024. Grandy, A.S., Keiluweit, M. Collaborative Research: Mineral-associated organic matter: an overlooked source and mediator of bioavailable nitrogen, National Science Foundation, Ecosystem Science Program (\$886,771 total; \$374,590 to Jilling)

Texas A&M University, Soil Health Institute, and Oklahoma State University (OSU co-PIs Kevin Wagner, **Andrea Jilling (Co-PI)**, Jason Warren, Sumit Sharma, Alex Rocateli, and Ali Mirchi), Sustainable Agricultural Intensification and Enhancement Through the Utilization of Regenerative Agricultural Management Practices, USDA NIFA, Sustainable Agricultural Systems (\$9,999,947 Total; \$2,628,546 to OSU; \$210,990 to Jilling)

Warren, J. (Co-PI) and **Jilling, A. (Co-PI)**. 9/2021-7/2022. Baseline soil sample collection for the Rainmaker farm, The Gulch Foundation (\$21,375 total)

SERVICE AND OUTREACH

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| 2019–2023 | Environmental Science Program Steering Committee member, College of Agriculture, Oklahoma State University |
| 2019 | Co-organizer of a Social Justice Science Communication Workshop, University of New Hampshire
<i>A one-month series focused on the intersection of social justice and science communication. We coordinated a three-week seminar series with experts in the field and concluded with an applied theatre training workshop to teach fundamental communication skills with an emphasis on how to intervene on issues of bias in STEM</i> |
| 2019 | NH Soils Day Instructor, NH Envirothon, training day for high school teachers |

PROFESSIONAL SOCIETIES

Ecological Society of America
Soil Science Society of America
American Geophysical Union