MATTHEW A. NIELAND

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RESEARCH INTERESTS

Soil Ecology, Microbial Ecology and Diversity, Ecosystem Ecology, Carbon and Nitrogen Biogeochemistry, Soil Microbiology, Global Change

PROFESSIONAL PREPARATION

Postdoc	Current	University of Massachusetts Amherst	Soil Ecology
Ph.D.	2023	Kansas State University	Biology
B.S.	2018	Morningside University (formerly Morningside College)	Biology
B.A.	2018	Morningside University	Chemistry

APPOINTMENTS

2024 – present	USDA-NIFA Postdoctoral Fellow, Stockbridge School of Agriculture, University of Massachusetts Amherst (UMass)
2023 – present	Postdoctoral Research Associate, Stockbridge School of Agriculture, UMass
2018 – 2023	Graduate Research Assistant, Division of Biology, Kansas State University (KSU)
2018	Summer Research Technician, Division of Biology, KSU
2017	Research Experience for Undergraduates Intern, Division of Biology, KSU

PEER-REVIEWED PUBLICATIONS

6. Keiser, A. D. and **Nieland, M. A.** 2025. "Interactions Are Key to Accurately Estimating the Impact of Photodegradation Across Grassland Ecosystems." Invited commentary. *Global Change Biology* DOI: 10.1111/gcb.70658
5. **Nieland, M. A.** and Keiser, A. D. 2025. "Using ecological restoration to disentangle the mechanisms and longevity of soil functional legacies. *Functional Ecology* DOI: 10.1111/1365-2435.70123
4. **Nieland, M. A.**, Lacy, P., Allison, S. D., Bhatnagar, J. M., Doroski, D. A., Frey, S. D., Greaney, K., Hobbie, S. E., Kuebbing, S. E., Lewis, D. B., McDaniel, M. D., Perakis, S. S., Raciti, S. M., Templer, P. H., Shaw, A., Sprunger, C. D., Strickland, M. S., Vietorisz, C., Ward, E. B., and Keiser, A. D. 2024. "Nitrogen Deposition Weakens Soil Carbon Control of Nitrogen Dynamics Across the Contiguous United States." *Global Change Biology* DOI: 10.1111/gcb.70016
3. **Nieland, M. A.** and Zeglin, L. H. 2024. "Plant and microbial feedbacks maintain soil nitrogen legacies in burned and unburned grasslands." *Journal of Ecology* DOI: 10.1111/1365-2745.14386
2. **Nieland, M. A.**, Carson, C. M., Floyd, V., and Zeglin, L. H. 2024. "Product-inhibition feedbacks, not microbial population level tradeoffs or soil pH, regulate decomposition potential under nutrient eutrophication." *Soil Biology and Biochemistry* DOI: 10.1016/j.soilbio.2023.109247

1. **Nieland, M. A.**, Moley, P., Hanschu, J., and Zeglin, L. H. 2021. "Differential Resilience of Soil Microbes and Ecosystem Functions Following Cessation of Long-Term Fertilization." *Ecosystems* DOI: 10.1007/s10021-021-00633-9

MANUSCRIPTS SUBMITTED, IN REVIEW, OR IN REVISION:

9. Zaret, M. M., Akley, E. K., Bookout, B., Broderick, C. M., Dea, H., Figge., J., Hawkins, J., Htoo, Z. W., Kailer, E., **Nieland, M. A.**, Nieves-Otero, P., Pandey, A., Richardson, C., Wanithunga, I., Wilson, E. J., Vega Anguino, N., and Zeglin, L. H. "Bison grazing and prairie fire shape soil microbial community diversity and assembly." *In revision* for Ecology.
8. Gewirtzman, J., Keiser, A. D., **Nieland, M. A.**, Palmer, C. A., Patel, V., and Forbes, E. S. "Low-Cost Autonomous Chambers Enable High Spatial and Temporal Resolution Monitoring of Soil CO_2 Exchange Across Landscapes." *Submitted* to JGR Biogeosciences.
7. Ajowele, J. A., Darst, A. L., Baker, N. R., Brenneman, R. R., Broderick, C., Cappelli, S. L., Liang, M., Linabury, M., **Nieland, M. A.**, Parker-Smith, M., Pehim Limbu, S., Terry, R. S., Young, M. L., Zaret, M., and Zaricor, M. "Multiple community properties drive ecosystem resistance and resilience to extreme climate events across mesic grasslands." *Resubmitted* for Ecology Letters.

MANUSCRIPTS IN PREPARATION (expected submission < 3 months):

***Nieland, M. A.**, *Wu, A., Palmer, C. A., Siller, A., Hashemi, M., and Keiser, A. D. "Termination management alters nitrogen release from cover crop decomposition." *In prep* for Soil Science Society of America Journal.

Nieland, M. A., Blair, J. M., Taylor, J. H., and Zeglin, L. H. "Persistent plant and microbial community states after ceasing chronic fertilization." *In prep* for Ecology Letters.

*Shared first-authorship

PUBLISHED DATASETS

5. Ajowele, J. A., Darst, A. L., Baker, N. R., Brenneman, R. R., Broderick, C., Cappelli, S. L., Liang, M., Linabury, M., **Nieland, M. A.**, Parker-Smith, M., Pehim Limbu, S., Terry, R. S., Young, M. L., Zaret, M., and Zaricor, M. (2025). "Species diversity and plant dominance influence grassland stability in response to extreme climatic events and anthropogenic drivers across three LTER sites: Cedar Creek, Konza Prairie, and Kellogg Biological Station, 1982-2023." *Environmental Data Initiative* DOI: 10.6073/pasta/330082c127413fadc278a7657abad27f
4. **Nieland, M. A.**, Lacy, P., Allison, S. D., Bhatnagar, J. M., Doroski, D. A., Frey, S. D., Greaney, K., Hobbie, S. E., Kuebbing, S. E., Lewis, D. B., McDaniel, M. D., Perakis, S. S., Raciti, S. M., Templer, P. H., Shaw, A., Sprunger, C. D., Strickland, M. S., Vietorisz, C., Ward, E. B., and Keiser, A. D. 2024. "Nitrogen Deposition Weakens Soil Carbon Control of Nitrogen Dynamics Across the Contiguous United States." *Dryad* DOI: 10.5061/dryad.g79cnp611
3. **Nieland, M. A.** and Zeglin, L. H. 2023. "PCN01 Plant and soil carbon and nitrogen pool data from the Belowground Plot Experiment at Konza Prairie." *Environmental Data Initiative* DOI: 10.6073/pasta/cb24fd55a0102723882ad33ed3f787b9

2. **Nieland, M. A.** and Zeglin, L. H. 2023. "SEA01 Soil extracellular enzyme activity data from the Belowground Plot Experiment." *Environmental Data Initiative* DOI: 10.6073/pasta/caff8cde33a6dca2b007e85b5c4a4000
1. **Nieland, M. A.** and Zeglin, L. H. 2023. "OMS01 Microbial and soil data in the Belowground Plot Experiment at konza prairie since 2017." *Environmental Data Initiative* DOI: 10.6073/pasta/41f0e5aa1781e722e7922aaaa6b57143

GRANTS RECEIVED

USDA NIFA, Nieland PI (UMass): "Evaluating integrated land restoration to improve belowground ecosystem health of US Midwest croplands." 2024-2026, total budget $225,000
Biology Graduate Student Association (BGSA) Finishing Grant (KSU): 2023
Graduate Student Council Travel Award (KSU): 2022
Arts & Sciences Research Travel Award (KSU): 2019, 2022
Kansas Natural Resources Conference (KNRC) Fee Waiver (KSU): 2022
BGSA Research Grant (KSU): 2021

AWARDS, FELLOWSHIPS, HONORS

USDA NIFA Postdoctoral Fellowship: "Evaluating integrated land restoration to improve belowground ecosystem health of US Midwest croplands." received 2024
Chris Edler Award for Outstanding Research on Konza: 2023
Graduate Student Award for 2020 Prescribed Fire Season: 2021
Ecology and Evolutionary Biology (EEB) Seminar: best science, 2019; best overall presentation, 2020; best style, 2021

TEACHING AND MENTORING

COURSE INSTRUCTION (Teval included if record saved)

Guest lecturer: Soil Ecology (STOCKSCH 622 - UMass). Fall 2024, ~15 students
Guest lecturer: Soil Ecology (STOCKSCH 622 – UMass). Fall 2023, ~20 students
Co-Instructor: Ecology Core Course (OEB 617 – UMass). Fall 2023, 16 students
Instructor of record: Ecology Lab (BIOL 632 – KSU). Spring 2023, 24 students
Teaching assistant: Ecology (BIOL 529 – KSU). Fall 2022, ~30 students
Instructor of record: Ecology Lab (BIOL 632 – KSU). Spring 2022, 24 students, TEVAL 5.0
Instructor: General Microbiology Lab (BIOL 455 – KSU). Fall 2021, 32 students, TEVAL 4.9
Instructor: Ecology Lab (BIOL 632 – KSU). Spring 2021, 25 students, TEVAL 4.9
Instructor: General Microbiology Lab (BIOL 455 – KSU). Fall 2020, 40 students
Instructor: General Microbiology Lab (BIOL 455 – KSU). Spring 2020, 40 students
Instructor: General Microbiology Lab (BIOL 455 – KSU). Fall 2019, 40 students
Instructor: General Microbiology Lab (BIOL 455 – KSU). Spring 2019, 40 students, TEVAL 4.5
Instructor: General Microbiology Lab (BIOL 455 – KSU). Fall 2018, 40 students, TEVAL 4.7

MENTORING

Megan Whiddon (Grad – UMass), Fall 2025

Henri Schuette (Honors Undergrad – UMass), 2023-2024
Sara Sadeghi (Grad – UMass), Summer 2024
Aiden Martin (Undergrad – UMass), 2024
Rachel Shurtz (Undergrad – KSU), Fall 2022
Clara Mayfield (Undergrad – Carleton College), Summer 2020
Clara Mayfield (High School – Manhattan High), Summer 2019
Brett Nave (Undergrad – KSU), 2018-2019

PEER REVIEW ACTIVITIES

JOURNAL REVIEWER (8 total)

Ecosphere (1), Ecosystems (1), Environmental Science and Pollution Research (1), Freshwater Biology (1), Geoderma (1), The International Society of Microbial Ecology (ISME) Journal (1), New Phytologist (1), Journal of Vegetation Science (1)

PROFESSIONAL SERVICE AND OUTREACH

Early Career Representative, Soil Ecology Section – Ecological Society of America (ESA), 2025-2027
Guest Speaker, Research and Extension Experiences for Undergraduates, Talk titled "Soil Life: What lives beneath our feet?". UMass, 2024
BGSA Research/Travel Grant Committee. KSU, 2023
BGSA President. KSU, 2022
BGSA Reform Committee. KSU, 2022-2023
External Evaluator, Independent Review Board for Morningside University (MU). 2021-2024
Guest Speaker, The SSTEM Project at MU. 2022
Career Panelist, Alumni Spotlight for the Pre-Professional Health Club at MU. 2021
BGSA Graduate Affairs Committee Student Representative. KSU, 2020
Girls Researching Our World (GROW), Office for the Advancement of Women in Science and Engineering. KSU, 2020
BGSA Manual Sales Coordinator. KSU, 2019-2020
Participant of the KSU Division of Biology Communications Workshop. KSU, 2019
Fire Crew Volunteer for Konza Prairie Biological Station. KSU, 2019-2022
Science Saturday, Sunset Zoo. KSU, 2017, 2020

SEMINARS AND PRESENTATIONS

INVITED SEMINARS

Nieland, M. A. 2021. "Reversing global change: Can fire help prairie ecosystem recovery from increased nitrogen availability?" Biological Sciences Department, Emporia State University. Emporia, KS, USA

CONTRIBUTED PRESENTATIONS (ORAL)

Keiser, A. D., Wu, A., Hashemi, M., Siller, A., and **Nieland, M. A.** (2025). "Cover crop termination method impacts N release and subsequent plant uptake." CANVAS. Salt Lake City, UT, USA
Nieland, M. A., Baer, S. G., and Keiser, A. D. (2025). "Persistence of soil functional legacies across a grassland restoration chronosequence." ESA Annual Meeting. Baltimore, MD, USA

Nieland, M. A. and Zeglin, L. H. (2023). "Burning does not shape grassland soil microbial diversity recovery from chronic nitrogen fertilization." ESA Annual Meeting. Portland, OR, USA

Nieland, M. A. and Zeglin, L. H. (2022). "Burning decreases grassland sensitivity, and increases resilience, to nitrogen fertilization." ESA Joint Meeting with Canadian for Ecology and Evolution. Montréal, QC, CA

Nieland, M. A. and Zeglin, L. H. (2022). "Burning Decreases Tallgrass Prairie Sensitivity, and Increases Resilience, to Chronic Supplemental Nitrogen." KSU Division of Biology Annual Graduate Student Research Forum. Manhattan, KS, USA

Nieland, M. A., Moley, P., Hanschu, J., Freeman, K., and Zeglin, L. H. (2022). "Fire influences tallgrass prairie recovery from nitrogen fertilization." KNRC. Manhattan, KS, USA

Nieland, M. A., Floyd, V., Carson, C. M., and Zeglin, L. H. (2021). "Above- and belowground responses to increased N and P availability from chronic fertilization and fire suppression." ESA Annual Meeting. Virtual

Nieland, M. A., Floyd, V., Carson, C. M., and Zeglin, L. H. (2021). "Belowground Responses to Increased Nitrogen and Phosphorus Availability from Chronic Fertilization and Fire Suppression." KSU Division of Biology Annual Graduate Student Research Forum. Virtual

Nieland, M. A., Moley, P., Allenbrand, J. H., Hanschu, J., and Zeglin, L. H. (2020). "Differential recovery of soil microbial functional groups and ecosystem functions following cessation of chronic fertilization." ESA Annual Meeting. Virtual

Burgin, A. J., Zeglin, L. H., **Nieland, M. A.**, Kelly, M. C., and Hanschu, J. (2019) "Whole river estimates of denitrification in response to a large-scale nitrogen enrichment of the Kansas River (USA)." Society of Freshwater Science (SFS) Annual Meeting. Salt Lake City, UT, USA

Zeglin, L. H., Hanschu, J., Burgin, A. J., Kelly, M. C., Overstreet, E., and **Nieland, M. A.** (2019). "Large river microbial community structure and function is affected by inputs of a fertilizer-enriched inoculum." SFS Annual Meeting. Salt Lake City, UT, USA

Moley, P., Hanschu, J., **Nieland, M. A.**, and Zeglin, L. H. (2018). "Differential responses of N-cycling soil microbial functional groups to cessation of chronic fertilization." ESA Annual Meeting. New Orleans, LA, USA

CONTRIBUTED PRESENTATIONS (POSTER)

Nave, B., **Nieland, M. A.**, Mueller, E., and Zeglin, L. H. "Does chronic nitrogen fertilization affect soil microbial tradeoffs?"

2020 Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) National Diversity in STEM Digital Conference. Virtual

2020 ESA Annual Meeting. Virtual

Nieland, M. A., Moley, P., Hanschu, J., and Zeglin, L. H. (2019). "Differential recovery of N-cycling soil microbial functional groups following cessation of chronic fertilization." ESA Annual Meeting. Louisville, KY, USA

Burgin, A. J., Kelly, M. C., Hanschu, J., **Nieland, M. A.**, and Zeglin, L. H. (2018). "Linking the Presence and Function of Denitrification Genes to Whole River Estimates of Denitrification in Response to a Large-Scale Enrichment of the Kansas River (USA)." American Geophysical Union. Washington, DC, USA

Nieland, M. A., Moley, P., Hanschu, J., and Zeglin, L. H. (2018). “Fire history causes differential recovery of N-cycling soil microbes from chronic fertilization.” LTER All Scientists’ Meeting. Pacific Grove, CA, USA