

Brooke E. Propson

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Education

2021-present Ph.D., University of Wisconsin-Madison: Soil Science (*estimated May 10th, 2026*)

Advisor: Zac Freedman – Committee: Alfred Hartemink, Erika Marín-Spiotta, Thea Whitman

Dissertation title: Climate change impacts on forest biogeochemistry: linking microbial structure and function to ecosystem-level carbon and nitrogen fluxes.

2015-2019 B.S., University of Michigan: Ecology and Evolutionary Biology

Appointments

2021-present National Science Foundation Graduate Research Fellow (NSF-GRF).

2021-2023 Graduate Research Assistant. University of Wisconsin-Madison.

2021 Analytical Chemist. University of Michigan Biological Station.

2019-2021 Research Assistant. Nadelhoffer Lab. University of Michigan Biological Station.

2018 NSF-REU Fellow. University of Massachusetts-Boston.

2017 Undergraduate Researcher. University of Michigan.

Grants and Fellowships (Total = \$169,000)

2026	\$1,500	Lee Sommers Graduate Education Fund Travel Grant
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2024	\$1,000	William A. Rothermel Soil Science Fund Travel Grant
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2023	\$1,000	Lee Sommers Graduate Education Fund Travel Grant
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2023-2024	\$3,500	O.N. Allen Soil and Environmental Microbiology Small Grant
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2022	\$1,000	Charles and Alice Ream Soil & Water Protection Travel Grant
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2021-2026	\$155,000	NSF Graduate Research Fellowship (NSF-GRF)
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2019	\$1,000	ASLO Multicultural Program Travel Grant
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2018	\$5,000	NSF-REU Fellowship, University of Massachusetts, Boston
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Peer-Reviewed Publications

Published & in press

3. Nave, L.E., Gough, C.M., Clay, C., Santos, F., Atkins, J.W., Benjamins-Carey, S., Bohrer, G., Castillo, B., Fahey, R.T., Hardiman, B.S., Hofmeister, K.L., Ivanov, V.Y., Kalejs, J., Matheny, A.M., Menna, A.C., Nadelhoffer, K.J., **Propson, B.E.**, Schubel, A., Tallant, J. (2025). Carbon cycling across ecosystem succession in a north temperate forest: Controls and management implications. *Ecological Applications*. 35(1): e70001
<https://doi.org/10.1002/ea.70001>

2. **Propson, B.E.**, Zak, D.R., Classen, A.T., Burton, A.J., Freedman, Z.B. (2024). Gains in soil carbon storage under anthropogenic nitrogen deposition are rapidly lost following its cessation. *Ecology*. 105(11): e4444
<https://doi.org/10.1002/ecy.4444>

1. Clay, C., Nave, L.E., Nadelhoffer, K.J., Vogel, C., **Propson, B.E.**, Den Uyl, J., Hickey, L.J., Barry, A., Gough, C.M. (2022). Fire after clear-cut harvesting minimally affects the recovery of ecosystem carbon pools and fluxes in a Great Lakes forest. *Forest Ecology and Management* 519:120301.
<https://doi.org/10.1016/j.foreco.2022.120301>

In review/revision

1. **Propson, B.E.**, Argiroff, W.A., Cagle, G.A., Upchurch, R.A., Zak, D.R., Grandy, A.S., Freedman, Z.B. Anthropogenic nitrogen deposition restructures decomposing microbial communities, altering SOM molecular composition, but not molecular complexity or diversity. In revision for *npj Soil Ecology*.
<https://doi.org/10.1101/2025.10.21.683748>

In preparation

1. **Propson, B.E.**, Zak, D.R., Stevenson, A.R., Klier, K.M., Cagle, G.A., and Freedman, Z.B. Metatranscriptomic mechanisms mediating soil carbon storage in response to declining levels of anthropogenic nitrogen deposition. In preparation for *Soil Biology and Biochemistry*.

Awards and Honors

2025 Jaya Iyer Award for best graduate student seminar

Awarded for: *The biogeochemistry of carbon at the University of Michigan Biological Station: A story of forest carbon through time*.

Oral Presentations

5. **Propson, B.E.** (2025). *The biogeochemistry of carbon at the University of Michigan Biological Station: A story of forest carbon through time*. Doctoral Departmental Seminar. UW-Madison Department of Soil and Environmental Sciences.

4. **Propson, B.E.**, Zak, D.R., Classen, A.T., Burton, A.J., and Freedman, Z.B. (2024). *Gains in soil carbon storage under anthropogenic nitrogen deposition are rapidly lost following its cessation*. Soil Ecology Society Biennial Meeting.

3. **Propson, B.E.** (2023). *Climate change impacts on forest biogeochemistry: linking microbial structure and function to ecosystem-level carbon and nitrogen fluxes*. Doctoral Prospectus Seminar. UW-Madison Department of Soil Science.

2. **Propson, B.E.** (2023). *Assessing ecosystem-level response to recovery from historically high rates of anthropogenic nitrogen deposition*. UW-Madison Center for Ecology and the Environment Research Symposium.

1. **Propson, B.E.**, Cagle, G.A., Zak, D.R., Upchurch, R.A., Freedman, Z.B. (2022). *Assessing the effect of nitrogen deposition and climatic variation on soil organic matter (SOM) chemistry in northern hardwood forests*. Soil Science Society of America Meeting.

Poster Presentations

7. **Propson, B.E.**, Klier, K.M., Stevenson, A.R., Classen, A.T., Burton, A.J., Zak, D.R., and Freedman, Z.B. (2025). *Legacy effects of anthropogenic nitrogen on microbial*

mechanisms mediating soil carbon storage. American Geophysical Union Annual Meeting. [[Link to 2025 AGU iPoster.](#)]

6. **Propson, B.E.**, Argiroff, W.A., Cagle, G.A., Upchurch, R.A., Zak, D.R., Grandy, S.A., and Freedman, Z.B. (2024). *Exploring the effect of nitrogen deposition on the trajectory of organic matter decomposition and its relationship with saprotrophic microbes.* American Geophysical Union Annual Meeting. [[Link to 2024 AGU iPoster.](#)]

5. **Propson, B.E.**, Argiroff, W.A., Cagle, G.A., Upchurch, R.A., Zak, D.R., Grandy, S.A., and Freedman, Z.B. (2023). *Assessing relationships between soil organic matter (SOM) chemistry and microbial diversity with implications for carbon storage in a changing climate.* American Geophysical Union Annual Meeting.

4. Clay, C., Nave, L.E., Nadelhoffer, K.J., Den Uyl, J., **Propson, B.E.**, Gough, C.M. (2021). *Net ecosystem production is similar across disturbance types in a century old North American eastern temperate forest chronosequence.* American Geophysical Union Annual Meeting.

3. Clay, C., Nave, L.E., Nadelhoffer, K.J., Den Uyl, J., **Propson, B.E.**, Gough, C.M. (2020). *Net ecosystem production across successional time in a North American eastern temperate forest chronosequence.* American Geophysical Union Annual Meeting.

2. **Propson, B.E.**, Hofmeister, K.L., Nadelhoffer, K.J., Den Uyl, J., Nave, L.E. (2020). *The Adaptive Aspen Management Project (AAME).* University of Massachusetts, Boston Earth Day Symposium.

1. **Propson, B. E.**, Dimino, T., McCanty, S.T., and Christian, A.D. (2019). *Assessing biodiversity responses to a headwater stream restoration project.* Association for the Sciences of Limnology and Oceanography (ASLO) Aquatic Sciences Meeting. 2019.

Teaching Experience

2023	Guest Lecturer. SOIL SCI 323: <i>Soil Biology</i> , UW-Madison
2022	Teaching Assistant. SOIL SCI 132: <i>Earth's Water</i> , UW-Madison
2021	Teaching Assistant. EEB 348: <i>Forest Ecosystems</i> , UofM Biological Station
2020-2021	Teaching Assistant. EEB 381: <i>General Ecology</i> , UofM Biological Station

Mentorship Experience

University of Wisconsin-Madison

2024	Eden Milan, B.S. student, Freedman Lab research assistant
2023	Ella DeRosier, B.S. student, BIO 152 independent research project
2022-2024	Emily Sautebin, B.S. student, Freedman Lab research assistant
2022-2023	Jeremy Fleck, B.S. student, Freedman Lab research assistant

Current: Ph.D. student at University of Colorado, Denver: Immunology

Extramural mentorship

2024-2025	Jae Robinson, B.S., EEB Mentor Match Program
	<i>Current: Ph.D. student at UC-Irvine: Ecology and Evolutionary Biology (Advisor: Dr. Steve Allison), 2025 National Science Foundation Graduate Research Fellow (NSF GRF)</i>
2023-2026	Annie Cress, B.S. student, University of Michigan Biological Station
	<i>Current: Ph.D. student at UT-Austin: Integrative Biology (Advisor: Dr. Amanda Koltz)</i>
2022-2025	Katie Ann Huy, A.S., B.S., EEB Mentor Match Program

*Current: Ph.D. student at Stanford University: Earth System Science (Advisor: Dr. Scott Fendorf),
2025 National Science Foundation Graduate Research Fellow (NSF GRF)*

Media Coverage

Phys.org press release, print coverage of Nave et al. 2025 Ecological Applications “Time is not the driving influence of forest carbon storage, study finds” (published 18 March 2025) [\[link\]](#)

Badger Science Explained, interviewed for and participated in video coverage of Propson et al. 2024 Ecology produced by UW-Madison office of science communication and posted by the UW-Madison official Instagram account (published 24 February 2025) [\[link\]](#)

Ecological Society of America press release, print coverage of Propson et al. 2024 Ecology “Battling air pollution may contribute to climate change” (published 7 November 2024) [\[link\]](#)

Flying Intuition Podcast, interview on life as a Ph.D. student (published 18 August 2023) [\[link\]](#)

Society Memberships

Ecological Society of America (ESA)

American Geophysical Union (AGU)

Soil Ecology Society (SES)

Synergistic and Volunteer Activities

2025-present Reviewer: *Biogeochemistry*

2024-present UW-Madison Center for Ecology and the Environment graduate student rep.

2024 Reviewer. O.N. Allen Soil & Environmental Microbiology Small Grants Program

2022-2024 Soil Science Department Graduate Student Council (graduate student-faculty liaison; council founder)

2022-2023 Madison Area Technical College STEM seminar speaker (once/semester)

2021-2023 Wisconsin Science Festival: Science on the Square volunteer (annually in fall)

2021 NSF Graduate Research Fellowship panelist. UW-Madison NSF GRF workshop

References

Dr. Zac Freedman

Assistant Professor, O.N. Allen Professor of Soil Microbiology, University of Wisconsin-Madison

Relation: Ph.D. advisor (2021-)

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Dr. Aimée Classen

Director, University of Michigan Biological Station

Professor, University of Michigan, Ann Arbor

Relation: Supervisor (2020-2021), Collaborator (2021-)

734-763-4461

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Dr. Lucas Nave

Research Associate Professor, Michigan Technological University

Relation: Research assistant (2019-2021), Collaborator (2021-)

906-482-6303 x1319

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Dr. Erika Marín-Spiotta

Professor, University of Wisconsin-Madison

Relation: Ph.D. committee member (2021-)

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