

Sophia F. Buysse

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Education

PhD Candidate, Michigan State University (MSU), East Lansing, MI *expected May 2026*

Dual Degree: (1) Plant Biology and (2) Ecology, Evolution, and Behavior (EEB)

Certificate in College Teaching

Advisors: Drs. Emily Josephs and Jeffrey Conner

Committee members: Drs. David Lowry and Sarah Fitzpatrick

Bachelor of Arts, College of Saint Benedict (CSB), St. Joseph, MN *May 2020*

Biology (major), Hispanic Studies (minor)

Honors: *Egregia cum laude*

Universidad Adolfo Ibañez, Viña del Mar, Chile (study abroad) *Fall 2018*

Teaching Experience

Guest Lecturer **September 2025**

Michigan State University, East Lansing, MI

- Quantitative Genetics Lecture for IBIO 341: Fundamental Genetics

Graduate Teaching Assistant **August 2021 – December 2024**

Michigan State University, East Lansing, MI

- IBIO 830: Statistical Methods in Ecology and Evolution *Fall 2024*
 - Assisted during lecture section twice a week
 - Led a guest lecture on “If statements and for loops in R”
- PLB341: Fundamental Genetics *Fall 2022*
 - Assisted during lecture section twice a week
 - Led 2 weekly recitation sections focused on teaching problem solving strategies
 - Developed course materials to improve inclusivity in teaching language and example problems
 - Presented a mini lecture on the application of recombination to study plant genetics
- BS161: Cells and Molecules Lecture *Spring 2022*
 - Team teaching of a 250 student ‘flipped’ lecture section consisting of pre-recorded lectures and in class activities
- BS171: Cells and Molecules Laboratory Online *Fall 2021*
 - Led 2 lab sections of 28 students each through online labs to simulate experiments, analyze data, and communicate results

Future Academic Scholars in Teaching (FAST) Fellowship **August 2022 – May 2025**

Michigan State University, East Lansing, MI

- Fellowship Steering Committee *August 2023 – present*
 - Provide mentorship and feedback to graduate students completing teaching-as-research projects
- FASTer Fellow *August 2023 – May 2024*
 - Selected as the peer mentor for students completing teaching-as-research projects
 - Developed and led weekly journal clubs for FAST Fellows
 - Coordinated monthly meetings with the FAST Fellowship Steering Committee composed of faculty from across the University to provide assistance to FAST Fellows

- Fellow August 2022 – May 2023
 - Selected as a fellow to participate in weekly professional development training and conduct discipline-based education research during a mentored teaching experience
 - Developed and executed an independent research project analyzing the connections students in an introductory biology lab make between science and their lives, and if modelling these connections improves student's writing about the relevance of their experiments beyond the classroom.

Pedagogy Training

- Creating a Transgender Inclusive STEM Environment: A Course for Educators, *spring 2026*
- Syllabus Development: Communicating Expectations with Care, *January 2025*
- Participation in monthly STEM pedagogy journal club, *2021-2025*
- Certificate in College Teaching, awarded *December 2024*
 - Find my portfolio here: <https://sfbuyse.github.io/CollegeTeaching/index.html>
- Culturally Responsive Teaching Workshop, *November 2024*
- Teaching College Science, *spring 2024*
 - ISE 870; Graduate Level Coursework focused on STEM pedagogy
- Certificate in College Teaching Institute, *May 2023*
- Advanced Learning Through Evidence-Based STEM Teaching, *spring 2023*
 - Massive Open Online Course provided through The Center for the Integration of Research Teaching and Learning
- An Introduction to Evidence-Based Undergraduate STEM Teaching, *fall 2022*
 - Massive Open Online Course provided through The Center for the Integration of Research Teaching and Learning
- Exploring Differences in the Biology Classroom: "How to represent wide-ranging family structures and personal identities using the latest pedigree nomenclature", *November 2022*
- Project Learning Tree Outdoor Education Training, *summer 2017*

Publications

*Undergraduate coauthors

3. Love, B. *, Conner, J. K., Josephs, E. B, **Buyse, S. F.** (2026). Faster vegetative growth in *Arabidopsis thaliana* in heat and drought. *microPublication Biology*. [10.17912/micropub.biology.001892](https://doi.org/10.17912/micropub.biology.001892)
2. **Buyse, S. F.**, Pérez, S. G., Puzey, J. R., Garrison, A., Bradburd, G. S., Oakley, C. G., Tonsor, S. J., Picó, F. X., Josephs, E. B., & Conner, J. K. (2025). Evaluating the Roles of Drift and Selection in Trait Loss along an Elevational Gradient. *Evolution*, 79(7), 1322-1333. <https://doi.org/10.1093/evolut/qpaf078>
1. Palande, S., Arsenault, J., Basurto-Lozada, P., Bleich, A., Brown, B. N. I., **Buyse, S. F.**, Connors, N. A., et al. (2024). Expression-Based machine learning models for predicting plant tissue Identity. *Applications in Plant Sciences*. <https://bsapubs.onlinelibrary.wiley.com/doi/10.1002/aps3.11621>.

Preprints

1. **Buyse, S. F.**, Nicholes, V. *, Conner, J. K., & Josephs, E. B. (2026). Differentiation for drought strategy but conserved plasticity to heat and drought in locally adapted populations of *Arabidopsis thaliana*. *bioRxiv*. <https://doi.org/10.64898/2026.01.07.698234>

Presentations

Adaptive and Maladaptive Plasticity in Leaf Number among Populations of *A. thaliana*

Coauthors: Jeffrey Conner and Emily Josephs

- Oral presentation (15 minutes): June 2025, Evolution, Athens, GA
- Oral presentation (15 minutes): May 2025, EEB Symposium, East Lansing, MI

Making Connections: The impact of modelling connections between reasoning and results on scientific literacy in an introductory biology lab

Coauthor: Mike Wiser

- Poster presentation: July 2024, Society for the Advancement of Biology Education Research Conference, Minneapolis, MN
- Poster presentation: June 2024, Botany Conference, Grand Rapids, MI
- Poster presentation: May 2023, Teaching Fellows Showcase, East Lansing, MI
- Poster presentation: May 2023, EEB Symposium, East Lansing, MI
- Oral presentation (15 minutes): May 2023, FAST Symposium, East Lansing, MI

Recombinant inbred lines expand variation in plasticity in *A. thaliana*

Coauthors: Emily Josephs and Jeffrey Conner

- Poster presentation: August 2023, Midwest Population Genetics, Ann Arbor, MI
- Poster presentation: June 2023, Evolution, Albuquerque, NM

Population Differentiation for Plasticity in *Arabidopsis thaliana*

Coauthors: Tori Nicholes, Jeffrey Conner, and Emily Josephs

- Oral presentation (25 minutes, hybrid): October 2024, EEB Colloquium, East Lansing, MI
- Oral presentation (45 minutes, hybrid): July 2022, PLB Department, East Lansing, MI
- Poster presentation: May 2022, EEB Symposium, East Lansing, MI **awarded 2nd place poster**
- Poster presentation: June 2022, Evolution, Cleveland, OH

Population Structure and Trail Loss along an Elevational Gradient

Coauthors: Sam Pérez, Josh Puzey, Ava Garrison, Gideon Bradburd, Chris Oakley, Stephen Tonsor, Xavier Picó, Emily Josephs and Jeffrey Conner

- Oral presentation (20 minutes): December 2022, EEB Colloquium, East Lansing, MI
- Virtual oral presentation (10 min): June 2021, Virtual Evolution Conference
- Virtual oral presentation (10 min): May 2021, EEB Symposium, East Lansing, MI

Honors, Scholarships, and Fellowships

- Educator of the Month, MSU Graduate School, *November 2025*
 - ▶ Read more: <https://grad.msu.edu/spotlights/educator-month-november-2025-sophie-buysse>
- Don Hall Fellowship, EEB, MSU, *summer 2025*
- Fields Award for Outstanding Teaching, PLB, Michigan State University, *May 2024*
- FAST and FASTER Fellowships, Graduate School, MSU, *fall 2022 – spring 2024*
- Triemer Graduate Student Summer Fellowship, PLB, Michigan State University, *summer 2023*
- KBS Summer Research Fellowship, Michigan State University, *summer 2023*
- EEB Summer Research Fellowship, Michigan State University, *summer 2022, 2024*
 - ▶ Co-sponsored by BEACON, an NSF Center for the Study of Evolution in Action in 2022
- Recruitment Fellowship, Michigan State University College of Natural Science, *Aug 2020- Aug 2021*

Mentorship

- Basia Love, *summer 2024 – spring 2025*
 - Independent research project: “Vegetative Growth Curves on Different *Arabidopsis thaliana* Populations Experiencing Drought Stress”
 - Mentored through experiment design, data collection, analysis in R, and scientific writing
 - Outcomes: research proposal, poster presentation in April 2025, research article
- Evan Adamski, *spring 2023 – spring 2024*
 - Independent course project: “Mapping Changing Quantitative Trait Loci in *Arabidopsis thaliana* using Various Climate Change Conditions”
- Athena Dila, Plant Genomics REU, *summer 2023*
 - Independent research project: “Genomic Signatures of Urban Adaptation in *Arabidopsis thaliana*”
 - Provided introduction to R and bioinformatics mentoring using publicly available data
 - Outcomes: poster presentation and oral presentation in August 2023
- Tori Nicholes, KBS REU, *summer 2022-spring 2023*
 - Independent research project: “Differences in plasticity to increased temperature and drought in two populations of *Arabidopsis thaliana*”
 - Led Tori through plant care, root washing and other phenotyping of 100 plants; provided introduction to R mentoring for statistics and data visualization
 - Outcomes: poster presentation in August 2022, blog post, [news article](#), manuscript *in review*
- Mentored 10 undergraduate research assistants without independent projects: Trevor Markwood, Tianyi Xia, Claire Henley, Kennedy Barnes, Claudia Colligan, Sophia Lanning, Jas Chalmers, Ellie Richards, Marissa Benn, Andrew Wade

Training

- Having Difficult Conversations with Students, *October 2024*
- Responsible Conduct of Research: Mentoring Case Studies, *September 2023*
- Building Effective Mentoring Relationships, *August 2022*
 - Engaged in a learning community centered around mentoring where mentoring challenges and methods were discussed
- Quest I: Foundations – Introduction to LGBTQA+ Identities and Inclusion, *summer 2022*

Lab Leadership Roles:

- Led Undergraduate Journal Club, *summer 2023*
- Led CV development workshop, *May 2021, May 2023, February 2024, December 2024*
- Led Personal Website Workshop, *November 2022*
- Led discussions and writing for the Conner Lab Anti-discrimination Action Plan, *summer 2021-summer 2024*
- Started and organized weekly Josephs lab writing club, *May 2021 – May 2022*

Outreach

- Skype A Scientist, *May 2023 – August 2025*
 - Virtual visits to 3 classrooms to talk about plant science
- Letters to a Pre-scientist, *matched 2023-2024 and 2024-2025*
 - Pen pal to middle school students in California
 - Answered questions about being a scientist including what I do, how I got here, and the challenges I overcame

- Gear Up, *May 2025*
 - Visit to 5 classrooms at Eastern High School, Lansing, MI to teach genetics curriculum with examples from the Josephs Lab
- MI DNA Day, *April 2023*
 - Visit to DeWitt high school classroom to present lesson on DNA and scientific careers
- Graduate Women in Science Girls and Science Volunteer, *May 2022*
 - Assisted in running 4 sessions of an activity on fish evolution for middle school girls
- Mid-Michigan Symposium for Undergraduate Research Experiences, *August 2021, 2024, 2025*
 - Judge undergraduate research poster presentations
- Michigan Career Quest Southwest, *May 2021*
 - Staff booth with KBS to answer questions from middle schoolers throughout the region about a career as a biologist
- Project Biodiversify, *2020*
 - Contribute examples of scientists from underrepresented minorities to a growing database which is available to search and creates material for educators
 - Buyse, S. 2020. Jantina Tammes: Inheritance of continuous traits can be explained by Mendelian genetics. Project Biodiversify <https://projectbiodiversify.org/jantina-tammes>
- Naturalist at Chippewa National Forest, *summer 2017*

Service

- Peer Mentorship Committee, Plant Biology Graduate Student Organization
 - Chair, *May 2023 – August 2025*
 - Understanding Comprehensive Exams, panelist: *February 2023*, moderator: *November 2024*
 - Mentor, *2021-2023*
 - Mentee, *2020-2021*
- Secretary for the Plant Biology Graduate Student Organization, *Aug 2021- May 2025*
- EEB Symposium Planning Committee Member, *Aug 2023 – May 2024*
- Seminar Committee for EEB Program seminar series, *Jan 2023 - Aug 2023*
- Envision EEB Graduate Student Panelist, *Fall 2022*
- Assisted in reviewing 5 journal articles with Dr. Jeffrey Conner or Dr. Emily Josephs

Professional Societies

- Society for the Advancement of Biology Education Research, *2024 - present*
- Botanical Society of America, *2024 - present*
- Society for the Study of Evolution (SSE), *2021 - present*
- Phi Beta Kappa Honor Society, *inducted 2019*
- Delta Epsilon Sigma Honor Society, *inducted 2019*

Professional References

Dr. Emily Josephs

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Michigan State University
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Relationship: PhD Co-advisor, TA supervisor

Dr. Jeffrey Conner

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Kellogg Biological Station
Michigan State University
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Phone: 269-491-0155
Relationship: PhD Co-advisor