

# Sophia F. Buysse

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## Education

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### Michigan State University (MSU)

East Lansing, MI

PhD Candidate, Plant Biology (PLB)

Ecology, Evolution, and Behavior (EEB) Dual Degree Program

Kellogg Biological Station (KBS), Hickory Corners, MI

Advisors: Drs. Emily Josephs and Jeff Conner

### College of Saint Benedict (CSB), May 2020

St. Joseph, MN

BA in Biology, *egregia cum laude*

Hispanic Studies Minor

### Universidad Adolfo Ibáñez, Fall 2018 study abroad

Viña del Mar, Chile

## Graduate Research Experience

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### Population Differentiation for Plasticity between *A. thaliana* populations in Sweden and Italy

Authors: Sophia Buysse, Jeff Conner, and Emily Josephs

- Growth chamber study with three treatments (150 plants) to determine differentiation between *A. thaliana* populations from Sweden and Italy for drought related traits and for plasticity of drought related traits
- Growth chamber study with two treatments using recombinant inbred lines to identify quantitative trait loci for plasticity (930 plants per growth season, four growth seasons).
- Mentored an REU student to determine population differentiation for root to shoot ratio, stomatal density, and plasticity in biomass allocation during summer 2022 (two treatments, 100 plants total).

### Population Structure and Short Stamen Loss in *Arabidopsis thaliana* Along An Elevational Gradient in the Spanish Pyrenees

Authors: Sophia Buysse, Ava Garrison, Sam Peréz, Joshua Puzey, Steve Tonsor, Emily Josephs and Jeff Conner

- Computation project combining phenotypic and genetic data to investigate trait loss in multiple populations of *A. thaliana* along an elevational gradient
- Gained familiarity with bioinformatics tools to create a pipeline from raw sequencing reads to analysis with PCA, GWAS, and population structure statistics
- Additional Collaborators: Xavier Picó, Gideon Bradburd

## Presentations

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### Population Differentiation for Plasticity in *Arabidopsis thaliana*

Coauthors: Dr. Jeffrey Conner, PLB and KBS, and Dr. Emily Josephs, PLB

- Poster presentation: May 2022, EEB Symposium, East Lansing, MI – third place poster
- Poster Presentation: June 2022, Evolution, Cleveland, OH
- Hybrid oral presentation (45 minutes): July 2022, East Lansing, MI

### Population Structure and Trail Loss along an Elevational Gradient

Coauthors: Dr. Emily Josephs, PLB, and Dr. Jeffrey Conner, PLB and KBS

Additional Collaborators: Ava Garrison, Sam Peréz, Joshua Puzey, Steve Tonsor, Xavier Picó, Gideon Bradburd

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

## **The Impact of Climate Change on Corn (*Zea mays L.*) Production in the Midwest**

Advisor: Dr. Gordon Brown, Biology Department, SJU

- Virtual poster presentation: April 2020, Scholarship and Creativity Day, Collegeville, MN

## **Analysis of REDD+ policy in Chile**

Advisor: Dr. Corrie Grosse, Environmental Studies Department, SJU

- Panelist: January 2020, Climate Justice for Revolution in Values, St. Joseph, MN
- Oral presentation (90min): March 2020, Bonner Leader Program, St. Joseph, MN

## **Genetic Influence on Drought-tolerance Traits in Quaking Aspen (*Populus tremuloides*)**

Advisor: Dr. William Anderegg, School of Biological Sciences, University of Utah, Salt Lake City, UT

Mentor: Kelly Kerr, PhD Candidate, School of Biological Sciences

- Poster presentation: August 2019, Summer Symposium, Salt Lake City, UT
- Oral presentation (15min): November 2020, Central Minnesota Audubon Society, St. Cloud, MN
- Oral presentation (15min): February 2020, Michigan State University, East Lansing, MI

## **Analyzing Genetic Diversity of Eastern White Pine (*Pinus strobus*) in the St. John's Abbey Arboretum**

Advisor: Dr. Katherine Furniss, Biology Department, SJU

- Poster presentation: April 2019, Scholarship and Creativity Day, Collegeville, MN

## **Impact of Wind and Salt Exposure on Seven Year Apple Tree (*Casasia clusiifolia*) Growth**

Advisors: Ms. Kristina Timmerman and Dr. Gordon Brown, Biology Department, SJU

- Poster presentation: April 2018, Scholarship and Creativity Day, Collegeville, MN

## **Teaching Experience**

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### **Graduate Teaching Assistant**

**Aug 2021-Dec 2022**

Plant Biology Department, Michigan State University, East Lansing, MI

- PLB341: Fundamental Genetics (Fall 2022)
  - ▶ Assisted during lecture section twice a week
  - ▶ Led 2 weekly recitation sections (1 hour and 30 students each) focused on teaching problem solving strategies
  - ▶ Contributed to course materials to improve inclusivity in teaching language and example problems
  - ▶ Presented a mini lecture on the application of recombination to study genetics (15 minutes)

Biological Sciences Program, Michigan State University, East Lansing, MI

- 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
- 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

### **Future Academic Scholars in Teaching Fellow**

**August 2022-May 2023**

Michigan State University, East Lansing, MI

- Developed and executed an independent research project to analyze the connections students in an introductory biology lab make between science experiments and their lives, and if modelling these connections improves student's writing about the relevance of their group experiments and improves scientific literacy
- Participated in weekly professional development training

### **Training and Certifications**

- 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
  - ▶ Completed with distinction
- 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
- ▶ Completed with distinction
- Exploring Differences in the Biology Classroom: "How to represent wide-ranging family structures and personal identities using the latest pedigree nomenclature", *November 2022*
- Participation in STEM pedagogy journal club, *2021-present*
- Project Learning Tree Outdoor Education Training

## Honors, Scholarships, and Fellowships

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- Future Academic Scholars in Teaching (FAST) Fellowship (\$5,000), Graduate School, Michigan State University, *Aug 2022- May 2023*
- EEB Summer Research Fellowship (\$7,500), Michigan State University, *Summer 2022*
  - ▶ Co-sponsored by BEACON, an NSF Center for the Study of Evolution in Action
- Summer Tuition Award, Michigan State University Graduate School (\$1,500), *Summer 2022*
- George H Lauff Scholarship - KBS Summer Funding Award for Research and Mentorship (\$1,600), Michigan State University, *Summer 2022*
- EEB Travel Funds (\$500), Michigan State University, *Summer 2022*
- Paul Taylor Travel Award (\$650), PLB, Michigan State University, *Summer 2022*
- Recruitment Fellowship (\$32,000), Michigan State University College of Natural Science, *Aug 2020- Aug 2021*
- Early Start Fellowship (\$6,000), Michigan State University College of Natural Science, *Jul 2020- Aug 2020*
- Phi Beta Kappa Honor Society, *inducted 2019*
- Delta Epsilon Sigma Honor Society, *inducted 2019*

## Mentorship

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- Undergraduate Research Assistant, *Fall 2022-present*
  - ▶ Trevor Markwood: Why do some plants need more water? Analysis of water usage between different genotypes in a common garden experiment (tentative title)
- KBS Research Experience for Undergraduates, *summer 2022-spring 2023*
  - ▶ Tori Nicholes: Differences in plasticity to increased temperature and drought in two populations of *Arabidopsis thaliana*
  - ▶ Tori received 2 extension to continue working on her project after the summer
  - ▶ Outcomes: poster presentation in August 2022, blog post, [news article](#)
- PLB Mentorship Program: Mentee, *2020-2021*; Mentor, *2021- current*
  - ▶ 1 year mentorship program to welcome incoming graduate students to the PLB department
  - ▶ Understanding Comprehensive Exams, panelist, *February 2023*
- SJU summer research fellowship, *summer 2018*
  - ▶ Mentored 2 undergraduate international researchers from China, in the lab and field to collect population genetics data (Eastern White Pine project, SJU)

## Training and Certifications

- Building Effective Mentoring Relationships, *August 17, 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*
  - ▶ Multi-part self paced training.

## Community Engagement and outreach

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- MI DNA Day presenter in local high school classroom, *April 2023*
- Envision EEB Graduate Student Panelist, *September 2022*
- Graduate Women in Science Girls and Science Volunteer, *May 2022*
  - ▶ Assisted in running 4 session of an activity on fish evolution for middle school girls
- Mid-Michigan Symposium for Undergraduate Research Experiences, *August 2021*

- ▶ Judge undergraduate research virtual 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 underrepresented minorities to a growing database which is available to search and creates material for teachers.
  - ▶ Buysse, S. 2020. Jantina Tammes: Inheritance of continuous traits can be explained by Mendelian genetics. Project Biodiversify <https://projectbiodiversify.org/jantina-tammes>
- Tech Savvy Day at Saint Cloud State University, *2017, 2019*
  - ▶ Role model for girls in STEM
  - ▶ Volunteer to help lead STEM activities and with logistics
- Within Lab Leadership Roles:
  - ▶ Led discussions and writing for the Conner Lab Anti-discrimination Action Plan, *summer 2021-present*
  - ▶ Started and organize weekly Josephs lab writing club, *May 2021 – May 2022*

## Service

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- Secretary/Webmaster for the Plant Biology Graduate Student Organization, *Aug 2021-present*
- Seminar Committee for EEB Program seminar series, *Jan 2023-present*
- Assisted in review for PNAS with Dr. Jeffrey Conner, *December 2020*
- Assisted in review for Evolution with Dr. Jeffrey Conner, *July 2021*
- Assisted in review for eLife with Dr. Emily Josephs, *March 2022 and May 2022*
- Assisted in review for Journal of Ecology with Dr. Jeffrey Conner, *September 2022*

## Society Membership

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- Society for the Study of Evolution (SSE), *2021-current*