

John W. Benning

Curriculum Vitae

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Appointments

- 2020 - 2023 **National Science Foundation Postdoctoral Fellow**
Department of Botany
University of Wyoming
Supporting scientists: Dr. Christopher Weiss-Lehman and Dr. Ruth Hufbauer
- 2019 - 2020 **Postdoctoral Research Associate**
Department of Plant & Microbial Biology
University of Minnesota – Twin Cities
Advisor: Dr. David Moeller

Education

- 2013 - 2019 **University of Minnesota – Twin Cities**
Ph.D., *Plant & Microbial Biology*
Advisor: Dr. David Moeller
- 2006 - 2010 **University of North Carolina at Chapel Hill**
B.A. with Distinction, *Anthropology*
Minor in Environmental Studies

Awards

Fellowships

Total: \$243,250

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|------|---|-----------|
| 2020 | Postdoctoral Research Fellowship in Biology
<i>National Science Foundation</i> | \$162,000 |
| 2018 | Phinney Graduate Fellowship in Plant Biology
<i>Dept. of Plant & Microbial Biology, University of Minnesota</i> | \$11,250 |
| 2017 | Charles J. Brand Graduate Fellowship
<i>University of Minnesota</i> | \$25,000 |
| 2013 | Graduate Excellence Fellowship
<i>College of Biological Sciences, University of Minnesota</i> | \$45,000 |

Recognitions

- 2019 **Philip C. Hamm Scholarship in the Plant Sciences**
University of Minnesota
Awarded annually to the top graduate student in the plant sciences at UMN
- President's Student Leadership and Service Award**
University of Minnesota
Presented to students for exceptional leadership and service to UMN and the surrounding community

Recognitions (*cont.*)

- 2019 **Best Student Talk Award**
University of Minnesota Plant & Microbial Biology Annual Symposium
- 2016 **Outstanding Performance Award for Teaching Assistants**
University of Minnesota College of Biological Sciences

Research Grants

Total: \$971,503

- 2022 **Developing and testing an eco-evolutionary theory for range limits** \$884,862
National Science Foundation
Co-PI with C. Weiss-Lehman (PI)
- 2020 **Postdoctoral Research Fellowship in Biology** \$45,000
National Science Foundation
- 2019 **Mini Grant for Backyard Science (PI)** \$2,720
University of Minnesota Institute on the Environment
- 2018 **Rosemary Grant Advanced Award** \$3,010
Society for the Study of Evolution
- 2017 **Doctoral Dissertation Improvement Grant** \$19,921
National Science Foundation
- 2016 **Alexander & Lydia Anderson Grant** \$2,990
University of Minnesota
- James J. Wilkie Fund for Natural History** \$1,500
University of Minnesota Bell Museum
- 2015 **Graduate Student Research Grant** \$1,000
Southern California Botanists
- Thesis Research Travel Grant** \$2,500
University of Minnesota
- 2014 **Carolyn Crosby Grant** \$2,900
University of Minnesota
- Wallace and Mary Lee Dayton Natural History Grant** \$1,300
University of Minnesota Bell Museum
- Rosemary Grant Award** \$2,500
Society for the Study of Evolution
- Doc Burr Grant** \$1,300
California Native Plant Society

Selected Talks

- 2022 Evolution Cleveland, OH, USA
- 2021 Evolution Virtual
- 2021 Indiana Univ. EEB Seminar (*invited*) Bloomington, IN, USA
- 2020 Univ. of Wyoming Botany Department Seminar Laramie, WY, USA
- 2020 American Society of Naturalists Asilomar, CA, USA
- 2018 Ecological Society of America (*invited*) New Orleans, LA, USA
- 2017 Evolution Portland, OR, USA

Publications

†*Equal contribution* **Undergraduate mentee* [Google Scholar Profile](#)

- 2023 **10** Benning, JW, Faulkner, A*, and Moeller, DA. Rapid evolution during climate change: demographic and genetic constraints on adaptation to severe drought. *Proceedings of the Royal Society B*, in press.
Preprint: <https://doi.org/10.1101/2022.05.10.491393>
- 2022 **9** Gorton, AJ†, Benning, JW†, Tiffin, PT, and Moeller, DA. 2022. The spatial scale of adaptation in a native annual plant and its implications for responses to climate change. *Evolution*, 76:2916-2929.
- 8** Benning, JW, Hufbauer, RA, and Weiss-Lehman, C. 2022. Increasing temporal variance leads to stable species range limits. *Proceedings of the Royal Society B*, 289:20220202.
- 2021 **7** Benning, JW and Moeller, DA. 2021. Plant-soil interactions limit lifetime fitness outside a native plant's geographic range margin. *Ecology*, 102:e03254
- 6** Benning, JW and Moeller, DA. 2021. Microbes, mutualism, and range margins: testing the fitness consequences of soil microbial communities across and beyond a native plant's range. *New Phytologist*, 229:2886-2900.
—*Parental leave in 2020*—
- 2019 **5** Benning, JW and Moeller, DA. 2019. Maladaptation beyond a geographic range limit driven by antagonistic and mutualistic biotic interactions across an abiotic gradient. *Evolution*, 73:2044-2059.
- 4** Benning, JW, Eckhart, VM, Geber, MA, and Moeller, DA. 2019. Biotic interactions contribute to the geographic range of an annual plant: herbivory and phenology mediate fitness beyond a range margin. *American Naturalist*, 193:786-797.
- 3** Hargreaves, AL, ..., Benning, JW, ...[16 authors total]. 2019. Seed predation increases from the Arctic to the Equator and from high to low elevations. *Science Advances*, 5:eaau4403.
- 2018 **2** Bolin, LG*, Benning, JW, and Moeller, DA. 2018. Mycorrhizal interactions do not influence plant-herbivore interactions in populations of *Clarkia xantiana* ssp. *xantiana* spanning from center to margin of the geographic range. *Ecology & Evolution*, 8:10743-10753.
- 2015 **1** Benning, JW. 2015. Odd for an ericad: nocturnal pollination of *Lyonia lucida* (Ericaceae). *American Midland Naturalist*, 174:204-218.

Outreach & Service

2019-present **Backyard Science** - Principal Investigator

mnbayardscience.org

- This project used a network of widely distributed “plots” (raised beds) across Minneapolis, MN, USA to increase urban plant diversity, provide resources for native arthropods, and engage community members in science. The beds were located on boulevards near households whose children assisted with collecting data on plant growth, phenology, and pollinator visitation. Since the pandemic started in 2020 and contact with households was limited, I have focused on making Backyard Science a DIY natural history and science exploration initiative accessible to all, with unique natural history games and activities, as well as information on creating native habitat at home.

2018 **Wallace Middle School** - Science Mentor

- In 2018 I initiated a science outreach program with the Woodrow Wallace Middle School in southern California, where the bulk of my dissertation work occurred. During field work trips, I visit the Environmental Science classroom to introduce them to my research, guide them through laboratory methods, and explore the scientific method. For our first project, we explored leaf microbial endophytes. After an introduction and overview of endophytes, we used actual laboratory methods to culture endophytes from leaves I collected only a few miles from their school. We grew the cultures for a month, and I returned to assay them with the students and subculture them for identification at UMN. My colleagues and I have plans to continue this project as a corollary of our long-term research program in the area.

2014-2020 **Market Science** - Logistics coordinator; Board Member

marketsci.org

- This science outreach initiative engages the public about topical science issues, promotes diversity in STEM fields, and provides interactive science activities for adults and children. Each Saturday from May through October, Market Science works with volunteer graduate students, post-docs, and faculty to lead “science discovery” sessions at farmers markets, fairs, and other informal public venues around Minnesota. The program covers a range of topics from photosynthesis to geology and reaches more than 5,000 visitors each year. I served as the logistics and recruitment coordinator, developed multiple lessons for the program, and was a founding board member.

Other service

2022 **Lead organizer:** American Society of Naturalists Symposium at Evolution 2022: *Evolution in Action*

2021 **Reviewer:** SSE Rosemary Grant Graduate Student Award

Mentor: Cientifico Latino Graduate School Mentorship Initiative

2020 **Panel member:** “How to choose a postdoc” panel at University of Minnesota

2014-2016 **Curriculum development and judge:** Minnesota Science Olympiad

Outreach & Service (*cont.*)

Peer review history

- 2022 Proceedings of the National Academy of Sciences; The American Naturalist; Journal of Ecology (x2); Global Change Biology
- 2021 Journal of Ecology; Journal of Biogeography; American Journal of Botany
- 2020 Global Change Biology; Proceedings of the Royal Society B; Ecology & Evolution
- 2018 PLoS Biology; Global Change Biology
- 2017 Journal of Tropical Ecology; Ecology & Evolution
- 2016 Journal of the Torrey Botanical Society
- 2015 Northeastern Naturalist

Teaching

Invited Lectures

- 2021 Experimental Design in the Field
University of Wyoming
Species Interactions in a Changing World
University of Minnesota
- 2017 Biotic Interactions and Climate Change
Carleton College, MN

Teaching Assistantships

University of Minnesota

- 2017 Plant, Algal, and Fungal Diversity and Adaptation
- 2016 General Botany
Received UMN Outstanding Performance Award for Teaching Assistants
- 2015 General Botany
- 2014 General Botany

Training

- 2014 Preparing Future Faculty
UMN semester-long course on learning theory, pedagogical strategies, and curriculum development

Mentoring

Undergraduates

 University of Wyoming

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|-----------|-------------------|-----------------------|
| 2021-2023 | Annaliese Bronner | Laboratory technician |
| | Alex Kissonergis | Laboratory technician |
| 2020 | Anna Carpenter | Laboratory technician |

Mentoring (*cont.*)

Undergraduates

University of Minnesota

- 2019 Isaac Olson Laboratory technician
Labiba Mahmud Laboratory technician
- 2018 Adam Kostanecki Summer field technician
- 2017-2018 Alexai Faulkner Laboratory/field technician
- Conducted independent research via the UMN Undergraduate Research Opportunities Program
 - Helped lead *Clarkia xantiana* resurrection experiment and is co-author on Benning, Faulkner, and Moeller (*in prep*)
- 2015-2017 Lana Bolin Laboratory/field technician
- Conducted independent research published in *Ecology & Evolution* (Bolin, Benning, and Moeller 2018)
 - Received UMN Philip C. Hamm Memorial Undergraduate Scholarship in the Plant Sciences
 - Participated in NSF Research Experience for Undergraduates program
- 2015 Soham Shah Laboratory/field technician
- Conducted independent research for UMN CBS Honors Thesis

References

David Moeller

Professor

University of Minnesota - Twin Cities

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Ruth Shaw

Professor

University of Minnesota - Twin Cities

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Christopher Weiss-Lehman

Assistant Professor

University of Wyoming

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Peter Tiffin

Professor

University of Minnesota - Twin Cities

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