

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

#### Recognitions

- 2019 **Philip C. Hamm Scholarship in the Plant Sciences**  
*University of Minnesota*
- President's Student Leadership and Service Award**  
*University of Minnesota*

### 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: \$86,641

- 2020 **Postdoctoral Research Fellowship in Biology** \$45,000  
*National Science Foundation*
- 2019 **Mini Grant for Backyard Science** \$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*

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### Selected Talks

- 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
- 2015 Univ. of Minnesota Plant Biological Sciences Seminar Saint Paul, MN, USA

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## Publications

\*Undergraduate mentee    †Equal contribution

### *In revision and in review*

- Gorton, AJ<sup>†</sup>, **Benning, JW<sup>†</sup>**, Tiffin, PT, and Moeller, DA. The spatial scale of adaptation in a native annual plant and its implications for responses to climate change. *In revision, Evolution*.  
Preprint: <https://doi.org/10.1101/2022.01.22.477135>

### *Published and in press*

- 2022    **8 Benning, JW**, Hufbauer, RA, and Weiss-Lehman, C. Increasing temporal variance leads to stable species range limits. *Proceedings of the Royal Society B*, *in press*.  
Preprint: <https://doi.org/10.1101/2021.08.09.455156>
- 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**, Suárez, E, Mehltreter, K, Myers-Smith, I, Vanderplank, SE, Slinn, HL, Vargas, Y, Haeussler, S, David, S, Muñoz, J, Almazán-Núñez, RC, Loughnan, D, **Benning, JW**, Moeller, DA, Brodie, JF, Morales, PA. 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.

### *Manuscripts in prep*

- **Benning, JW**, Faulkner, A\*, and Moeller, DA. Adaptive evolution despite massive demographic decline during a historic drought. *In prep*.

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## Outreach & Service

- 2019-present **Backyard Science** - Principal Investigator  
*citybackyardscience.org*
- This project (with A. Gorton, Co-PI) uses 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 are located on boulevards near households that assist us with collecting data on plant growth, phenology, and pollinator visitation. As the number of plots increases, we will use them to teach and answer questions about urban plant adaptation, links between plant diversity and insect diversity, and effects of soil microbial inoculation on plant performance.
- 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 reach more than 5,000 visitors each year. I served as the logistics and recruitment coordinator, developed multiple lessons for the program, and am 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

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## Outreach & Service (*cont.*)

### Peer review history

- 2022 Proceedings of the National Academy of Sciences; The American Naturalist; Journal of Ecology
- 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

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## 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*

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## Mentoring

### Undergraduates

- *University of Wyoming*
- 2021 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