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## Appointments

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

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## Education

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

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## Awards & Fellowships

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- 2019-2020 **Postdoctoral Research Fellowship in Biology**, National Science Foundation
- 2018-2019 **Philip C. Hamm Scholarship in the Plant Sciences**, Univ. of Minnesota  
**President's Student Leadership and Service Award**, Univ. of Minnesota  
**Best Student Talk Award**, Plant & Microbial Biology Annual Symposium
- 2017-2018 **Bernard and Jean Phinney Graduate Fellowship in Plant Biology**, Dept. of Plant & Microbial Biology
- 2016-2017 **Charles J. Brand Fellowship**, Univ. of Minnesota
- 2015-2016 **Outstanding Performance Award for Teaching Assistants**, Univ. of Minnesota
- 2013-2014 **Graduate Excellence Fellowship**, CBS, Univ. of Minnesota

## Research Funding

**Total: \$71,641**

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2019-2020	<b>NSF Postdoctoral Research Fellowship in Biology</b>	\$30,000
2018-2019	<b>Mini Grant</b> ; UMN Institute on the Environment	\$2,720
2017-2018	<b>Rosemary Grant Advanced Award</b> , Society for the Study of Evolution	\$3,010
2016-2017	<b>NSF Doctoral Dissertation Improvement Grant</b>	\$19,921
2015-2016	<b>Alexander &amp; Lydia Anderson Grant</b> , Univ. of Minnesota	\$2,990
	<b>James J. Wilkie Fund for Natural History</b> , Univ. of Minnesota	\$1,500
2015-2016	<b>Graduate Student Research Grant</b> , Southern California Botanists	\$1,000
	<b>Thesis Research Travel Grant</b> ; Univ. of Minnesota	\$2,500
2014-2015	<b>Carolyn Crosby Grant</b> , Univ. of Minnesota	\$2,900
	<b>Wallace and Mary Lee Dayton Natural History Grant</b> , Bell Museum	\$1,300
	<b>Rosemary Grant Award</b> , Society for the Study of Evolution	\$2,500
	<b>Doc Burr Grant</b> , California Native Plant Society	\$1,300

## Publications

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7. **Benning, JW** and Moeller, DA. 2020. Microbes, mutualism, and range margins: testing the fitness consequences of soil microbial communities across and beyond a native plant's range. *New Phytologist*, *in press*.
  6. **Benning, JW** and Moeller, DA. 2020. Plant-soil interactions limit lifetime fitness outside a native plant's geographic range margin. *Ecology*, *in press*.
  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.
  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.  
\*Undergraduate mentee

## Publications (*cont.*)

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1. **Benning, JW**. 2015. Odd for an ericad: nocturnal pollination of *Lyonia lucida* (Ericaceae). *American Midland Naturalist*, 174:204-218.

## Manuscripts *in prep*

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**Benning, JW**, Faulkner, A, and Moeller, DA. Evolutionary responses of a native plant to multi-year drought in Southern California. In prep.

**Benning, JW**<sup>†</sup>, Moeller, DA<sup>†</sup>, Geber, MA, Morris, WF, Eckhart, VM, Singh, I, Bier, RL, and Tiffin, P. Interannual climate-driven fluctuations in plant-herbivore interactions have eco-evolutionary consequences across a plant's geographic range. In prep. <sup>†</sup> *equal contribution*

## Selected Presentations

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“Ecology and Evolution of Species' Range Boundaries: Biotic Interactions, Ecological Gradients, and the Limits to Adaptation.” Invited seminar, University of Wyoming Botany Department Seminar, Laramie, WY. 24 September 2020.

“Biotic interactions combine with abiotic gradients to set the geographic range limit of a California annual plant.” Presentation, Meeting of the American Society of Naturalists, Pacific Grove, CA. 6 January 2020.

“Species interactions and the evolution of geographic range limits in *Clarkia xantiana*.” Presentation, Annual Meeting of the Ecological Society of America, New Orleans, LA. 8 August 2018.

“Microbes, lagomorphs, and the geographic range limit of a California endemic wildflower.” Presentation, Annual Meeting of the Society for the Study of Evolution, Portland, OR. 27 June 2017.

“Exploring the pollination ecology of a common ericad and its nocturnal visitors.” Poster, Annual Meeting of the Ecological Society of America, Minneapolis, MN. 9 August 2013.

## Outreach, Service, & Professional Development

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### - **Market Science** - 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, we work with volunteer graduate students, post-docs, and faculty to lead “science discovery” sessions at farmers markets, fairs, and other informal public venues around Minnesota. We cover a range of topics from photosynthesis to geology and reach more than 5,000 visitors each year. I served as a project lead and recruitment coordinator, and am a founding board member.

## Outreach, Service, & Professional Development (*cont.*)

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- **Backyard Science** - Principal Investigator (A. Gorton, Co-PI) [citybackyardscience.org](http://citybackyardscience.org)  
This recently funded project uses a network of widely distributed “plots” (raised beds) across South Minneapolis 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 answer questions about urban plant adaptation, links between plant diversity and insect diversity, and effects of soil microbial inoculation on plant performance.
  
- **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 occurs. 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.
  
- **Reviewer for:** PLoS Biology; Global Change Biology; Northeastern Naturalist; Journal of the Torrey Botanical Society; Ecology & Evolution; Journal of Tropical Ecology

## Teaching

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### Guest Lectures

“Biotic interactions and climate change.” Invited lecture, Carleton College. 2 November 2017.

### Teaching Assistantships

2014 *General Botany*  
2015 *General Botany*  
2016 *General Botany*  
2017 *Plant, Algal, and Fungal Diversity and Adaptation*

## Mentoring

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### Undergraduates

- 2015 Soham Shah
  - UMN CBS Honors Thesis
- 2016 Lana Bolin
  - NSF Research Experience for Undergraduates program
  - Published directed research in *Ecology & Evolution* (Bolin, Benning, and Moeller 2018)
  - Received Philip C. Hamm Memorial Undergraduate Scholarship
- 2017 Alexai Faulkner
  - UMN Undergraduate Research Opportunities Program
- 2018 Adam Kostanecki
  - Summer field technician
- 2019 Labiba Mahmud
  - Laboratory technician
- Isaac Olson
  - Laboratory technician