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Education

University of Minnesota - Twin Cities

Ph.D. candidate, Plant & Microbial Biology, September 2013 - Present

University of North Carolina at Chapel Hill

Bachelor of Arts with Distinction, Anthropology, December 2010

Minor in Environmental Science and Studies

Awards & Fellowships

- 2018-2019 **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: \$40,741

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| 2018-2019 | Mini Grant ; UMN Institute on the Environment
<i>City Backyard Science</i> | \$2,720 |
| 2017-2018 | Rosemary Grant Advanced Award , Society for the Study of Evolution
<i>Plant - leaf endophyte interactions across and beyond the geographic range of Clarkia xantiana</i> | \$3,010 |
| 2016-2017 | NSF Doctoral Dissertation Improvement Grant
<i>Biotic interactions and the geographic range limit of Clarkia xantiana across a complex environmental gradient</i> | \$19,921 |
| 2015-2016 | Alexander & Lydia Anderson Grant , Univ. of Minnesota
<i>Do biotic interactions modulate the geographic distribution of Clarkia xantiana?</i> | \$2,990 |

Research Funding (cont.)

2015 - 2016	James J. Wilkie Fund for Natural History , Univ. of Minnesota <i>Quantifying patterns of biotic interactions across the range of Clarkia xantiana</i>	\$1,500
	Graduate Student Research Grant , Southern California Botanists <i>Do biotic interactions modulate the geographic distribution of Clarkia xantiana?</i>	\$1,000
	Thesis Research Travel Grant ; Univ. of Minnesota <i>Biotic interactions and the geographic range limit of Clarkia xantiana</i>	\$2,500
2014-2015	Carolyn Crosby Grant , Univ. of Minnesota <i>Does herbivory contribute to the geographic range limit of Clarkia xantiana?</i>	\$2,900
	Wallace and Mary Lee Dayton Natural History Grant , Bell Museum <i>Do biotic interactions modulate the geographic distribution of Clarkia xantiana?</i>	\$1,300
	Rosemary Grant Award , Society for the Study of Evolution <i>Plant - microbe interactions across the range of Clarkia xantiana</i>	\$2,500
	Doc Burr Grant , California Native Plant Society <i>Effects of antagonistic and mutualistic interactions on the geographic distribution of Clarkia xantiana ssp. xantiana</i>	\$1,300

Publications

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*. in press.

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.

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

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

Publications (in review)

Benning, JW and Moeller, DA. 2019. Maladaptation beyond a geographic range limit driven by antagonistic and mutualistic biotic interactions across an abiotic gradient. *Evolution*.

Presentations

- “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.
- “Why do species stay still? Range limits in *Clarkia xantiana*.” Presentation, UMN Plant Biological Sciences Seminar, St. Paul, MN. 2 October 2015.
- “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

- **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, faculty, and agency researchers 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. As a founding board member, from 2014 - 2018 I served as a project lead, logistical manager, and recruitment coordinator, and now sit on the Advisory board.

- **Backyard Science** - Principal Investigator

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 will be located on boulevards near households that assist researchers in 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. My colleagues and I have plans to continue this project as a corollary of our long-term research program in the area.

Outreach, Service, & Professional Development (cont.)

- **Reviewer for:** PLoS Biology; Global Change Biology; Northeastern Naturalist; Journal of the Torrey Botanical Society; Ecology & Evolution; Journal of Tropical Ecology

Teaching

Invited 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

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

Summer field technician

2018 Adam Kostanecki

Summer field technician