

## German Vargas Gutiérrez, Ph.D.

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### Education

- 2021 Ph.D. Plant Biological Sciences, University of Minnesota  
2016 Lic. Natural Resources Management (Honors: *Summa cum laude*), National University of Costa Rica  
2013 B.Sc. Tropical Biology, National University of Costa Rica

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### Professional interests

Plant eco-physiology, plant hydraulics, photosynthesis, functional ecology, forest dynamics, global change biology, ecological forecasting, ecological modeling, phylogenetics, social and environmental justice, natural resources management.

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### Professional experience

- 2022 – present Climate and Global Change Postdoctoral fellow, University Corporation for Atmospheric Research (UCAR), National Oceanic and Atmospheric Administration (NOAA). Hosting institution: University of Utah.  
2021 – 2022 Postdoctoral Research Associate, School of Biological Sciences, University of Utah.  
2019 – 2022 Research Associate, International Institute of Tropical Forestry, U.S. Department of Agriculture – Forest Service, Puerto Rico.  
2016 – 2021 Graduate Research Assistant, College of Biological Sciences, University of Minnesota.  
2015 – 2016 Field Technician, College of Biological Sciences, University of Minnesota.  
2014 – 2015 Graduate Research Assistant, National University of Costa Rica.  
2014 Research Fellow Associate, Smithsonian Tropical Research Institute.  
2013 Research Intern, College of Biological Sciences, University of Minnesota.  
2011 – 2013 Undergraduate Research Assistant, National University of Costa Rica.

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### Publications

#### Peer-reviewed Journal Articles

18. Smith-Martin, C. M., R. Muscarella, W. M. Hammond, S. Jansen, T. J. Brodribb, B. Choat, D. M. Johnson, **G. Vargas G.**, and M. Uriarte (2023). Hydraulic diversity of tropical forest communities is largely independent of water availability. *Ecology Letters* 26(11): 1829-1839. DOI: <https://doi.org/10.1111/ele.14314>
17. **Vargas G., G.**, D. Perez-Aviles, N. Raczka, D. Pereira-Arias, J. Tijerín-Triviño, L. D. Pereira-Arias, D. Medvigy, B. G. Waring, E. Morrissey, E. Brzostek and J. S. Powers (2023). Throughfall exclusion and fertilization effects on tropical dry forest tree plantations, a large-scale experimental approach. *Biogeosciences* 20(11): 2143–2160. DOI: <https://doi.org/10.5194/bg-20-2143-2023>
16. Beidler, K V., J. S. Powers, J. M. Dupuy-Rada, C. Hulshof, D. Medvigy, C. Pizano, B. Salgado-Negret, S. J. Van Bloem, **G. Vargas G.**, B. G. Waring and P. G. Kennedy (2023). Seasonality regulates the structure and biogeochemical impact of ectomycorrhizal fungal communities across environmentally divergent neotropical dry forests. *Journal of Ecology* 111(8): 1598-1613. DOI: <https://doi.org/10.1111/1365-2745.14112>
15. Toro, L., D. Pereira, D. Perez-Aviles, **G. Vargas G.**, F. M. Soper and J. S. Powers (2023). Phosphorus limitation of early growth differs between nitrogen-fixing and nonfixing dry tropical forest trees. *New Phytologist* 237(3): 766-779. DOI: <https://doi.org/10.1111/nph.18612>
14. **Vargas G., G.**, N. Kunert, W. M. Hammond, Z. C. Berry, L. K. Werden, C. Smith-Martin, B. Wolfe, L. Toro, A. Mondragón-Botero, J. Pinto-Ledezma, N. B. Schwartz, M. Uriarte, L. Sack, K. Anderson-Teixeira and J. S. Powers (2022). Leaf habit affects the distribution of drought sensitivity but not water transport efficiency in the tropics. *Ecology Letters* 25: 2637-2650. DOI: <https://doi.org/10.1111/ELE.14128>
13. Becknell, J. M., **G. Vargas G.**, L. A. Wright, N.-F. Woods, D. Medvigy and J. S. Powers (2022).

- Increasing liana abundance and associated reductions in tree growth in secondary seasonally dry tropical forest. *Frontiers in Forests and Global Change* 5: 838357. DOI: <https://doi.org/10.3389/ffgc.2022.838357>
12. Schwartz, N., D. Medvigy, J. Tijerin, D. Perez-Aviles, D. Rivera-Polanco, D. Pereira-Arias, **G. Vargas G.**, L. Werden, L. Arnold and J. S. Powers (2022). Intra-annual variation in microclimatic conditions in relation to vegetation type and structure in two tropical dry forests undergoing secondary succession. *Forest Ecology and Management* 511: 120132. DOI: <https://doi.org/10.1016/j.foreco.2022.120132>
  11. Coppineters, K., H. Verbeeck, S. Dequeker, J. S. Powers, **G. Vargas G.**, C. Smith-Martin, K. Steppe and F. Meunier (2022). Two co-occurring liana species strongly differ in their hydraulic traits in a water-limited Neotropical forest. *Frontiers in Forests and Global Change* 5: 836711. DOI: <https://doi.org/10.3389/ffgc.2022.836711>
  10. Wu, D., **G. Vargas G.**, J. S. Powers, N. G. McDowell, J. M. Becknell, D. Pérez-Aviles, D. Medvigy, Y. Liu, G. G. Katul, J. C. Calvo-Alvarado, A. Calvo-Obando, A. Sanchez-Azofeifa and X. Xu (2022). Reduced ecosystem resilience quantifies fine-scale heterogeneity in tropical forest mortality responses to drought. *Global Change Biology* 28: 2081-2094. DOI: <http://doi.org/10.1111/gcb.16046>
  9. Powers, J. S., A. Mondragón-Botero, N. Norden, B. Salgado-Negret, C. Pizano, R. González-M and **G. Vargas G.** (2022). Discovering the forest in plain sight: A pop-up symposium focusing on seasonally dry tropical forests. *New Phytologist* 233: 62-65. DOI: <https://doi.org/10.1111/nph.17644>
  8. **Vargas G., G.**, T. J. Brodribb, J. M. Dupuy, R. Gonzalez-M., C. M. Hulshof, D. Medvigy, T. A. P. Allerton, C. Pizano, B. Salgado-Negret, N. B. Schwartz, S. J. Van Bloem, B. G. Waring and J. S. Powers (2021). Beyond leaf habit: generalities in plant function across 97 tropical dry forest tree species. *New Phytologist* 232: 148–161. DOI: <https://doi.org/10.1111/nph.17584>
  7. Becknell, J., **G. Vargas G.**, D. Perez-Aviles, D. Medvigy and J. S. Powers (2021). Above-ground net primary productivity in regenerating seasonally dry tropical forest: Contributions of rainfall, forest age and soil. *Journal of Ecology* 109: 3903–3915. DOI: <https://doi.org/10.1111/1365-2745.13767>
  6. Waring, B., M. De Guzman, D. Du, J. M. Dupuy, M. Gei, J. Gutknecht, C. M. Hulshof, N. Jelinski, A. Margenot, D. Medvigy, C. Pizano, B. Salgado-Negret, N. B. Schwartz, A. Trierweiler, S. Van Bloem, **G. Vargas G.** and J. S. Powers (2021). Soil biogeochemistry across Central and South American tropical dry forests. *Ecological Monographs* 91(3): e01453. DOI: <https://doi.org/10.1002/ecm.1453>
  5. Powers, J. S., **G. Vargas G.**, T. J. Brodribb, N. B. Schwartz, D. Perez-Aviles, C. M. Smith-Martin, J. M. Becknell, F. Aureli, R. Blanco, E. Calderon-Morales, J. C. Calvo-Alvarado, A. J. Calvo-Obando, M. M. Chavarria, D. Carvajal-Vanegas, C. D. Jimenez-Rodriguez, E. M. Chacon, C. M. Schaffner, L. K. Werden, X. Xu, and D. Medvigy (2020). A catastrophic tropical drought kills hydraulically vulnerable tree species. *Global Change Biology* 26(5): 3122-3133. DOI: <https://doi.org/10.1111/gcb.15037>
  4. Kandlikar, G. S., M. Vaz, R. Kreibel, **G. Vargas G.**, F. A. Michelangeli, R. Cordero, F. Almeda, G. Avalos, N. Fetcher & N. J. B. Kraft (2018). Low functional and phylogenetic turnover, but high taxonomic turnover of melastomes across a Costa Rican elevation gradient. *Journal of Tropical Ecology* 34(3): 204-208. DOI: <https://doi.org/10.1017/S0266467418000172>
  3. **Vargas G., G.**, L.K. Werden, and J.S. Powers (2015). Explaining legume success in tropical dry forests based on seed germination niches: a new hypothesis. *Biotropica* 47(3): 277 – 280. DOI: <https://doi.org/10.1111/btp.12210>
  2. **Vargas G., G.** and J. E. Hidalgo-Mora (2013). Sucesión de un bosque tropical seco en la Isla San Lucas, Puntarenas, Costa Rica. *Cuadernos de Investigación UNED* 5(2): 261-269. DOI: <https://doi.org/10.22458/urj.v5i2.280>
  1. **Vargas G., G.** and R. A. Cordero S. (2013). Photosynthetic responses to temperature of two tropical rainforest tree species from Costa Rica. *Trees* 27(5): 1261-1270. DOI: <https://doi.org/10.1007/s00468-013-0874-0>

**Manuscripts Under Review** *draft available upon request*

**Vargas G., G.**, H. Marcano, T. Ruzycski, T. Wood, W. R. L. Anderegg, J. S. Powers and E. H. Helmer. Aridity and forest age mediate landscape scale patterns of tropical forest resistance to cyclonic storms. *Journal of Ecology*. In Review, 2023. Pre-print available: <https://doi.org/10.22541/au.169651630.06248226/v1>

Wang, Y. S. D., D. Yang, **G. Vargas G.**, G. Y. Hao, J. S. Powers, Q. Wang, Y. B. Zhang and J. L. Zhang. Leaf

habit differentiation explains trait tradeoffs across savanna woody plants. *Forest Ecosystems. In Review*, 2023.

#### Data, code & software

6. Vargas G., G., D. Perez-Aviles, N. Raczka, D. Pereira-Arias, J. Tijerín-Triviño, L. D. Pereira-Arias, D. Medvigy, B. G. Waring, E. Morrissey, E. Brzostek and J. S. Powers (2023). Throughfall exclusion and fertilization effects on tropical dry forest tree plantations, a large-scale experiment, Dryad, Dataset, <https://doi.org/10.5061/dryad.5x69p8d6r>
5. Becknell, J., G. Vargas G., D. Perez-Aviles, D. Medvigy and J. S. Powers (2021). Edaphic factors modulate seasonally dry tropical forest productivity response to rainfall variability: a ten year record. (2021), Aboveground net primary productivity in regenerating seasonally dry tropical forest: contributions of rainfall, forest age, and soil, Dryad, Dataset, <https://doi.org/10.5061/dryad.2jm63xsq4>
4. Vargas G., G., T. J. Brodribb, J. M. Dupuy, R. Gonzalez-M., C. M. Hulshof, D. Medvigy, T. A. P. Allerton, C. Pizano, B. Salgado-Negret, N. B. Schwartz, S. J. Van Bloem, B. G. Waring and J. S. Powers (2021). Beyond leaf habit: generalities in plant function across 97 tropical dry forest tree species, Dryad, Dataset, <https://doi.org/10.5061/dryad.ttdz08kzj>
3. Waring, B., M. De Guzman, D. Du, J. M. Dupuy, M. Gei, J. Gutknecht, C. M. Hulshof, N. Jelinski, A. Margenot, D. Medvigy, C. Pizano, B. Salgado-Negret, N. B. Schwartz, A. Trierweiler, S. Van Bloem, G. Vargas G. and J. S. Powers (2021). Soil biogeochemistry across Central and South American tropical dry forests, Dryad, Dataset, <https://doi.org/10.5061/dryad.v15dv41vf>
2. Powers, J. S., G. Vargas G., T. J. Brodribb, N. B. Schwartz, D. Perez-Aviles, C. M. Smith-Martin, J. M. Becknell, F. Aureli, R. Blanco, E. Calderon-Morales, J. C. Calvo-Alvarado, A. J. Calvo-Obando, M. M. Chavarria, D. Carvajal-Vanegas, C. D. Jimenez-Rodriguez, E. M. Chacon, C. M. Schaffner, L. K. Werden, X. Xu, and D. Medvigy (2020), A catastrophic tropical drought kills hydraulically vulnerable tree species, Dryad, Dataset, <https://doi.org/10.5061/dryad.2rbnzs7jp>
1. Vargas G., G. (2019). Plant Eco-physiology Tools: Pressure Volume Curves. [https://github.com/gevargu/Plant\\_Ecophysiology\\_Tools/tree/master/Pressure%20Volume%20Curves](https://github.com/gevargu/Plant_Ecophysiology_Tools/tree/master/Pressure%20Volume%20Curves)

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#### Fellowships, Grants and Awards (total: \$ 845,193)

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##### Grants

- 2022 National Science Foundation. LTREB: A Mechanistic Understanding of Ecosystem Resilience and Recovery in Seasonally Dry Tropical Forest Experiencing Disturbance. PI: Jennifer Powers, Co-PI: David Medvigy, Senior Personnel: **German Vargas G.**, Justin Becknell, Christina Smith-Martin, and Mikey O'Brien. **\$597,693**

##### Fellowships and Awards

- 2022 NOAA Climate & Global Change Postdoctoral Fellowship: A mechanistic framework to forecast vegetation resilience to drought across scales. Hosting institution: University of Utah, Mentor: William R.L. Anderegg, Project Collaborator: David Medvigy. **\$156,000**
- 2020 Doctoral Dissertation Fellowship, Graduate School, University of Minnesota (UMN). **\$25,000**
- 2019 Student Fellowship, Near-term Ecological Forecasting Initiative award. **\$700**
- 2019 Dissertation Fellowship, Interdisciplinary Center for the Study of Global Change (ICGC), UMN. **\$10,000**
- 2018 Pre-dissertation Fellowship, ICGC, UMN. **\$4,000**
- 2018 Pathways to Advance Student Success Fellowship, College of Biological Sciences (CBS), UMN. **\$2,500**
- 2017 Summer Fellowship, Department of Plant and Microbial Biology, UMN. **\$6,000**
- 2017 Wilkies Natural History Award, Bell Museum of Natural History, UMN. **\$2,500**
- 2017 Plant hydraulics workshop, Plant Physiology Section, Ecological Society of America. **\$500**
- 2017 Student Travel Fellowship, U.S. Department of Energy. **\$400**
- 2016 Scholar Fellowship, ICGC, UMN. **\$20,000**
- 2016 Diversity Enrollment Fellowship, CBS, UMN. **\$10,000**
- 2015 Donald and Beverly Stone Fellowship, Organization for Tropical Studies (OTS). **\$2,500**
- 2014 Short-term Fellowship, Smithsonian Tropical Research Institute (STRI), Panama. **\$3,200**
- 2012 Undergraduate Internship, STRI, Panama. **\$2,400**

## Teaching experience

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### Teaching Assistant:

Plant and Microbial Biology Orientation, PMB 8900-2, 2020, University of Minnesota.  
Applied Biostatistics, BIOL 3272/5272, TA, 2018-2019, University of Minnesota.  
Plant Anatomy and Physiology, BIF 404, 2011-2012, National University of Costa Rica.

### Guest Lecturer:

Biogeography of plant drought tolerance, BTNY 3473: Plant Geography, Weber State University.  
Using conditionals “*ifelse*” in R statistical programming language, National University of Costa Rica.  
Climate Change Ecology, EEB 3001: Ecology and Society, University of Minnesota.  
Community Ecology, EEB 3001: Ecology and Society, University of Minnesota.  
Light response curves using a Li-Cor Infrared Gas Analyzer LI-6400xt, National University of Costa Rica.

### Mentorship:

*Postgraduate Trainees:* Alejandra Pérez Enríquez, Kasper Coppieters, Simon Dequeker, Caroline Bray, Slendy Rodríguez Alarcón.  
*Undergraduate students:* Lillie I. Congram, Rubi del Mar Santiago, Julio Zúñiga Marín, Duncan Coles, David Rivera Polanco, Fiorella R. Durán, Gabriela Quesada Ávila.

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## Presentations (first author only)

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### Professional meetings and conferences

- Vargas G., G.,** H. Marcano, T. Ruzycski, T. Wood, and W. R. L. Anderegg, J. S. Powers, and E. H. Helmer (2023). Functional drivers of tropical forest resistance to hurricane disturbances. Oral presentation during the Ecological Society of America conference (Portland, USA).
- Vargas G., G.,** K. L. Kerr, L. D. L. Andergegg, and W. R. L. Anderegg (2022). Incorporating spatial trait variation in a stomatal optimization model to predict plant sensitivity to drought. Poster presentation during the Multiscale Plant Vascular Biology Gordon Research Conference (Maine, USA).
- Vargas G., G.,** N. Kunert, W. M. Hammond, Z. C. Berry, L. K. Werden, C. Smith-Martin, B. Wolfe, L. Toro, A. Mondragón-Botero, J. Pinto-Ledezma, N. B. Schwartz, M. Uriarte, L. Sack, K. Anderson-Teixeira and J. S. Powers (2021). Plant hydraulics and rainfall niches: a mechanistic approach to explain species distributions across tropical biomes. Oral presentation during the American Geophysical Union (New Orleans, USA).
- Vargas G., G.** (2021). Leaf habits determine the variation of drought tolerance in tropical dry forest trees. Presentation in Spanish, Pop-up Symposium on Tropical Dry Forest Ecology (Virtual).
- Vargas G., G.,** D. Perez-Aviles, D. Pereira-Arias, J. Tijerín-Triviño, L. D. Pereira-Arias, D. Medvigy, B. G. Waring, and J. S. Powers (2021). Drought-ex: soil fertility affects tropical dry forest responses to experimental drought. Oral presentation, Ecological Society of America (Virtual).
- Vargas G., G.,** D. Perez-Aviles, D. Medvigy, J. Becknell and J. S. Powers (2020). Plant Hydraulic Traits Variation Across Temporal and Spatial Scales Affects Responses to Drought in the Tropical Dry Forest Biome. Oral presentation, American Geophysical Union (Virtual).
- Vargas G., G.,** D. Perez-Aviles, D. Medvigy, B. Waring and J. Powers (2018). Tropical dry forest’s responses to drought depend upon soil nutrient availability and plant community composition. Poster presentation during the American Geophysical Union (Washington DC, USA).
- Vargas G., G.,** X. Xu, C. Smith, D. Medvigy, L. Werden, J. Becknell, T. Brodribb, D. Pérez-Aviles and J. Powers (2017). Mortality of tropical dry forest tree species following an extreme drought. Oral presentation at the symposium “Exploring the fate of tropical forests under drier climates: linking mechanisms to models”, Association for Tropical Biology and Conservation, (Merida, Mexico).
- Vargas G.,** D. Medvigy, F. Hoffman, X. Yang, B. Waring, K. Allen, X. Xu, A. Trierweiler, C. Pizano, B. Salgado, Juan Dupuy, C. Hulshof, S. V. Bloem, T. Brodribb, C. Smith, D. Perez, M. Gei, E. Calderon and J. Powers (2017). Understanding the effects of drought and nutrient deposition on tree growth in tropical dry forests. Poster presentation at the Department of Energy-Environmental System Science PI meeting (Washington DC, USA).
- Vargas G., G.** (2016). Drought adaptations of tropical dry forest trees in relation to stand age and soil type

- (Licentiate thesis defense). National University of Costa Rica (Heredia, Costa Rica).
- Vargas G., G.** & T. Brenes-Arguedas (2013). Physiological tradeoffs in carbon assimilation, growth and drought tolerance among 20 tropical shade tolerant plant species. Oral presentation at the 2013 ATBC Annual Meeting: New Frontiers in Tropical Biology the Next 50 Years (San José, Costa Rica).
- Vargas G., G.** & R.A. Cordero S. (2012). Leaf Photosynthetic Responses to Temperature of Two Tropical Rainforest Tree Species. Oral presentation at the 6th International Canopy Conference, (Oaxaca, Mexico).
- Departmental seminars and invited talks**
- Vargas G., G.** (2023). Rasgos Funcionales aplicados a la restauración ecológica. Variabilidad intra-específica de rasgos fisiológicos y su importancia en un modelo. Invited participation in a discussion forum for the Latin American Network of Plant Ecophysiologicalists (Virtual).
- Vargas G., G.** (2023). Variabilidad intra-específica de rasgos fisiológicos y su importancia en un modelo mecanístico de optimización estomática. Invited talk in Spanish for the Latin American Network of Plant Ecophysiologicalists (Virtual).
- Vargas G., G.** (2023). Understanding plant responses to environmental stress through plant physiology. Departmental seminar, Oregon State University (Corvallis, Oregon).
- Vargas G., G.** (2023). Understanding ecological resilience through plant physiology. Departmental seminar, University of Tennessee Knoxville (Knoxville, Tennessee).
- Vargas G., G.** (2023). Studying forests' vulnerability to climate change through plant ecophysiology. Departmental seminar, University of Arizona (Virtual).
- Vargas G., G.** (2023). Understanding the distribution of drought tolerance in tropical forests. ForestGEO Seminar Series, Smithsonian Research Institute (Virtual).
- Vargas G., G.** (2022). Understanding ecological resilience through plant physiology. Departmental seminar, Auburn University (Auburn, Alabama).
- Vargas G., G.** (2022). Linking plant function to ecological processes. Departmental seminar, Weber State University (Ogden, Utah).
- Vargas G., G.** (2021). Size-dependent drought sensitivity of tree diameter growth in a tropical dry forest. Invited oral presentation for the National Science Foundation Long-Term Ecological Research (LTER) Network Community Building Seminars (Virtual).
- Vargas G., G.** (2019). Drought tolerance and climate change adaptation in tropical dry forest trees. Invited talk, II Simposio Cultivo de Especies Forestales Nativas (Guanacaste, Costa Rica).
- Vargas G., G.** (2018). Rainfall manipulation in a tropical dry forest. Lightning talk, Department of Plant and Microbial Biology Spring Retreat, University of Minnesota (Saint Paul, Minnesota).
- Vargas G., G.** (2017). Studying the vulnerability to climate change of Mesoamerican dry forests. Invited talk, Universidad Marista de Merida (Merida, Mexico).

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### **Additional training**

- 2022 Training in outreach and building community relationships in the sciences, STEM Ambassador Program (<https://stemap.org/>), College of Science, The University of Utah.
- 2020 Google Earth-Engine Data Suite Use. Organization for Tropical Studies.
- 2019 Near-term Ecological Forecasting Course. Near-term Ecological Forecasting Initiative, Boston University.
- 2019 HHMI Teaching Assistant Course: Inclusive Teaching and Diversity, College of Biological Sciences, University of Minnesota (Spring Session 3).
- 2018 HHMI Teaching Assistant Course: Inclusive Teaching and Diversity, College of Biological Sciences, University of Minnesota (Fall Session 2).
- 2018 HHMI Teaching Assistant Course: Inclusive Teaching and Diversity, College of Biological Sciences, University of Minnesota (Spring Session 1).
- 2017 Plant Hydraulics Workshop Summer 2017 Ecological Society of America – Physiology Section, University of Idaho.

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## Professional service

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### Public outreach

- 2022 Science outreach on the role of tropical trees in the water cycle to public high school students in Costa Rica. Collaboration with the Biological Education Program of Guanacaste Conservation Area (<https://www.gdfcf.org/biological-education-peb>).
- 2019 Science outreach on the impacts of drought in tropical dry forests to local conservation and tourism stakeholders, Guanacaste Conservation Area, Costa Rica. Collaboration with the organization Investigadores ACG (<http://investigadoresacg.org/blog/>).
- 2019 Science outreach on tropical dry forest monitoring and climate change to high school students in collaboration with the organization Seeds of Change (<https://www.soc-cr.org/>).
- 2019 Science outreach on flower anatomy, pollination and reproduction in plants to public elementary school students, Guanacaste Conservation Area, Costa Rica (<https://www.gdfcf.org/biological-education-peb>).
- 2018 Market Science outreach on tropical plant diversity to children and adults in Midtown Farmer's Market, Minneapolis, Minnesota (<https://cbs.umn.edu/market-science>).

### Contributions to Diversity, Equity, and Inclusion in STEM

- 2020 – present Diversity, Equity, and Inclusion Committee. Member, Association for Tropical Biology and Conservation.
- 2020 – 2021 Diversity, Equity, and Inclusion Committee, Department of Plant and Microbial Biology, University of Minnesota.

### Professional memberships

- 2020 – present Ecological Society of America (ESA)
- 2018 – present American Geophysical Union (AGU)
- 2017 – present Association for Tropical Biology and Conservation (ATBC)

**Manuscript Reviews:** *Basic Applied Ecology, Biotropica, Ecology and Evolution, Ecology Letters, Ecological Monographs, Ecosystems, FLORA, Functional Ecology, Journal of Ecology, Journal of Vegetation Science, New Phytologist, OIKOS, Plant Physiology, PloS One, Proceedings of the National Academy of Science, Proceedings of the Royal Society B: Biological Sciences, Revista de Biología Tropical.*

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### Skills

**Languages:** Spanish (native), English (fluent), Portuguese (Beginner)

**Software, and programming skills:** R, JAGS (Bayesian statistics), C++, Git, Linux, Shell scripting, ImageJ, Google Earth Engine, ArcGIS, QGIS.

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### Professional References

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- Dr. Jennifer Powers; [powers@umn.edu](mailto:powers@umn.edu); Ph.D. supervisor
- Dr. William R.L. Anderegg; [anderegg@utah.edu](mailto:anderegg@utah.edu); postdoctoral research mentor
- Dr. Eileen Helmer; [eileen.helmer@usda.gov](mailto:eileen.helmer@usda.gov); collaborator at the USDA Forest Service
- Dr. David Medvigy; [dmedvigy@nd.edu](mailto:dmedvigy@nd.edu); postdoctoral research collaborator
- Dr. Roberto Cordero S.; [ticolamb@gmail.com](mailto:ticolamb@gmail.com); collaborator in Costa Rica and undergraduate advisor.