

Andrew Siefert

Curriculum Vitae

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Positions

- 2021–present Postdoctoral Research Associate, Department of Botany, University of Wyoming
- 2017–2021 Statistical Modeler, Office of Analytics and Institutional Research, Ithaca College, Ithaca, NY
- 2014–2017 Postdoctoral Scholar, Department of Evolution and Ecology, University of California, Davis

Education

- 2014 Ph.D., Biology, Syracuse University. Dissertation: *Intraspecific trait variation and community assembly in old-field grasslands*
Advisors: Mark Ritchie, Jason Fridley
- 2007 B.S., Environmental Resource Management, Pennsylvania State University
Advisor: Hunter Carrick

Publications

- Siefert, A.** and Laughlin, D.C. 2023. Estimating the net effect of functional traits on fitness across species and environments. *Methods in Ecology and Evolution*, in press. bioRxiv doi: 10.1101/2022.02.10.479905
- Siefert, A.**, Friesen, M.L., Zillig, K.W., Aguilar, J., and Strauss, S.Y. 2021. An experimental test of stabilizing forces in the field niche. *Ecology* 102: e03290.
- Fajardo, A. and **Siefert, A.** 2019. The interplay among intraspecific leaf trait variation, niche breadth and species abundance along light and soil nutrient gradients. *Oikos* 128: 881-891.
- Siefert, A.**, Zillig, K.W., Friesen, M.L., and Strauss, S.Y. 2019. Mutualists stabilize coexistence of congeneric legumes. *American Naturalist* 193: 200-212.
- Siefert, A.**, Zillig, K.W., Friesen, M.L., and Strauss, S.Y. 2018. Soil microbial communities alter conspecific and congeneric competition consistent with patterns of field coexistence in *Trifolium* congeners. *Journal of Ecology* 106: 1876-1891.
- Fajardo, A. and **Siefert, A.** 2018. Intraspecific trait variation and the leaf economics spectrum across resource gradients and levels of organization. *Ecology* 99: 1024-1030.
- Li, Y., Shipley, B., Price, J., Dantas, V., Tamme, R., Westoby, M., **Siefert, A.**, et al. 2018. Habitat filtering determines the functional niche occupancy of plant communities worldwide. *Journal of Ecology* 106: 1001-1009.
- Bowsher, A., **Siefert, A.**, Shetty, P., Anacker, B., Strauss, S.Y., and Friesen, M.L. 2017. Transcriptomic responses to conspecific and congeneric competition in coexisting *Trifolium*. *Journal of Ecology* 105: 602-615.

- Pierce, S., ..., **Siefert, A.**, et al. 2017. A global method for calculating plant CSR ecological strategies applied across biomes worldwide. *Functional Ecology* 31: 444-457.
- Fajardo, A. and **Siefert, A.** 2016. Temperate rainforest species partition fine-scale gradients in light availability based on their leaf mass per area. *Annals of Botany* 118: 1307-1315.
- Siefert, A.** and Ritchie, M.E. 2016. Intraspecific trait variation drives functional responses of old-field plant communities to nutrient enrichment. *Oecologia* 181: 245-255.
- Fajardo, A. and **Siefert, A.** 2016. Phenological variation in leaf functional traits within species. *Oecologia* 180: 951-959.
- Siefert, A.** et al. 2015. A global meta-analysis of the relative extent of intraspecific trait variation in plant communities. *Ecology Letters* 18: 1406-1419.
- Siefert, A.**, Lesser, M., and Fridley, J.D. 2015. How do climate and dispersal traits limit ranges of tree species along latitudinal and elevational gradients? *Global Ecology and Biogeography*, 24: 581-593.
- Siefert, A.**, Fridley, J.D., and Ritchie, M.E. 2014. Community functional responses to soil and climate at multiple spatial scales: when does intraspecific variation matter? *PLOS ONE* 9: e111189.
- Moles, A., ..., **Siefert, A.**, et al. 2014. Which is a better predictor of plant traits: temperature or precipitation? *Journal of Vegetation Science* 25: 1167-1180.
- Siefert, A.**, Ravenscroft, C., Weiser, M. and Swenson, N.G. 2013. Functional beta diversity patterns reveal deterministic community assembly processes in eastern North American trees. *Global Ecology and Biogeography* 22: 682-691.
- Siefert, A.** 2012. Incorporating intraspecific variation in tests of trait-based community assembly. *Oecologia* 170: 767-775.
- Siefert, A.**, Ravenscroft, C., et al. 2012. Scale dependence of vegetation-environment relationships: a meta-analysis of multivariate data. *Journal of Vegetation Science* 23: 942-951.
- Siefert, A.** 2012. Spatial patterns of functional divergence in old-field plant communities. *Oikos* 121: 907-914.
- Kattge, J., ..., **Siefert, A.**, et al. 2011. TRY- a global database of plant traits. *Global Change Biology* 17: 2905-2935.
- Carrick, H.J., Godwin, C.M., Johnston-Greenwald, M., Rilk, C., **Siefert, A.**, and Tzilkowski, C.J. 2007. Evaluation of water quality in a spring fed stream based upon benthic algae and macroinvertebrates. *Journal of the Pennsylvania Academy of Sciences* 80: 71-78.

In review

- Siefert, A.**, Laughlin, D.C., and Sabatini, F.M. You shall know a species by the company it keeps: leveraging co-occurrence data to improve ecological prediction. bioRxiv doi: 10.1101/2023.02.15.528518
- Fajardo, A., **Siefert, A.**, and Laughlin, D.C. Leaf size and wood density jointly explain woody plant growth rates across a sharp precipitation gradient.

Conference presentations

- Siefert, A.** and Laughlin, D.C. 2022. Fitness landscapes for temperate trees across a climatic gradient. Ecological Society of America Annual Meeting, Montreal, QC.
- Siefert, A.** and Laughlin, D.C. 2022. Learning vector representations of species from co-occurrence data. International Biogeography Society Biennial Conference, Vancouver.
- Siefert, A.** and Laughlin, D.C. 2021. Performance landscapes for temperate trees across a climatic gradient. International Association of Vegetation Science Virtual Symposium.
- Siefert, A.** 2020. Open the black box: interpretable machine learning for student retention. National Symposium on Student Retention.
- Snyder, R., **Siefert, A.**, and Mulugetta, Y. 2019. What makes a difference? Cloud automation of real-time student retention predictions. Higher Education Data Warehousing Forum, Ann Arbor, MI.
- Siefert, A.**, Strauss, S.Y., Friesen, M.L., Zillig, K.W., and Aguilar, J. 2017. Coexistence in *Trifolium* assemblages: an experimental test of stabilizing forces in the field niche. Ecological Society of America Annual Meeting, Portland, OR.
- Siefert, A.**, Zillig, K.W., Friesen, M.L., and Strauss, S.Y. 2016. Testing the role of niche differences and rhizobial mutualists in stabilizing coexistence of congeneric legumes. Ecological Society of America Annual Meeting, Fort Lauderdale, FL.
- Siefert, A.**, Zillig, K.W., Friesen, M.L., and Strauss, S.Y. 2015. Soil mutualists mediate interactions of *Trifolium* species: implications for fine-scale co-occurrence. Ecological Society of America Annual Meeting, Baltimore, MD.
- Siefert, A.** and Lesser, M. 2014. Up the mountain, north to the pole: do species' elevational and latitudinal limits match? International Biogeography Society Special Meeting, Montreal.
- Siefert, A.**, Fridley, J.D., and Ritchie, M.E. 2013. Variation in plant functional traits across a latitudinal gradient: does intraspecific variation matter? 11th INTECOL Congress, London, UK.
- Siefert, A.**, Swenson, N.G., and Weiser, M. 2013. Scale dependence of vegetation-environment relationship: a case study on North American trees. International Biogeography Society Biennial Meeting, Miami, FL.
- Siefert, A.**, Ravenscroft, C., Weiser, M. and Swenson, N.G. 2012. Patterns of functional beta diversity reveal deterministic assembly processes in North American tree communities. Ecological Society of America Annual Meeting, Portland, OR.
- Siefert, A.** 2011. Spatial patterns of functional diversity in old-field plant communities. Ecological Society of America Annual Meeting, Austin, TX.
- Siefert, A.** and Mills, E.M. 2009. Temperature and nutrients influence interannual variability of phytoplankton succession in Oneida Lake, NY. Great Lakes Research Consortium Annual Meeting, Syracuse, NY.
- Siefert, A.** and Carrick, H.J. 2007. Effects of fish in stream food webs. International Association of Great Lakes Research Annual Conference, University Park, PA.
- Siefert, A.** and Carrick, H.J. 2007. Top-down trophic interactions in a benthic stream community. Environmental Chemistry Student Symposium, Penn State University.
- Siefert, A.** and Green, T. 2005. Effects of changes in canopy cover on understory vegetation in the Long Island Pine Barrens. Pine Barrens Research Forum, Brookhaven, NY.

Invited talks

- 2021 Botany Seminar, University of Wyoming
- 2017 Biology Seminar, Shepherd University
- 2017 Ecology and Evolutionary Biology Seminar, Virginia Tech
- 2016 Evolution, Ecology, and Behavior Seminar, University of Virginia
- 2016 Biology Department Seminar, University of San Francisco
- 2015 Center for Population Biology Seminar, University of California, Davis
- 2015 Conservation Science Seminar, Chicago Botanic Garden
- 2015 Guest Scientist Lecture, Cleveland Botanical Garden
- 2015 Fridays in the Garden (public seminar), Holden Arboretum, Kirtland, OH

Teaching and mentorship

- Fall 2021 Invited Lecturer, Experimental Design (undergraduate course), U. of Wyoming
- 2019–2020 Instructor, Machine Learning and Ethics (undergraduate course), Ithaca College
- 2015–2017 Undergraduate research mentor, ESA Strategies for Ecology Education, Diversity and Sustainability (SEEDS), UC Davis Chapter
- 2014 Certificate in University Teaching, Future Professoriate Program, Syracuse University
- 2013–2014 Syracuse University Project Advance (program linking Syracuse University researchers with local high school teachers)
- Spring 2013 Instructor, Exceptional Life (undergraduate biology course), Syracuse University
- Spring 2013 Invited lecturer, Multivariate Statistics (graduate course), Syracuse University
- Spring 2011 Teaching assistant, Integrative Biology (undergraduate lab), Syracuse University
- 2009–2011 Teaching assistant, General Biology (undergraduate lab), Syracuse University
- Summer 2007 State Parks Interpreter, Massachusetts Dept. of Conservation & Recreation

Grants, fellowships, and awards

- 2015 Gourevitch Memorial Award (best dissertation in Biology), Syracuse University
- 2012 – 2014 Doctoral Dissertation Improvement Grant, National Science Foundation (\$13,769). *Community trait responses to environmental variation: assessing the roles of species turnover, genetic differentiation, and phenotypic plasticity.*
- 2011 – 2014 Graduate Research Fellowship, National Science Foundation (\$128,000). *Trait-based plant community assembly: incorporating space and intraspecific variation.*
- 2012 Best Poster Presentation, Syracuse University Life Sciences Symposium
- 2007 Summer Research Scholarship, Pennsylvania State University
- 2007 Best Undergraduate Oral Presentation, Penn State Environmental Chemistry Student Symposium
- 2003 – 2007 Schreyer Honors College Academic Excellence Award, Pennsylvania State University

Service, outreach, and affiliations

- 2010–present Member of Ecological Society of America, International Biogeography Society, International Association of Vegetation Science
- 2021–present Member of Modelscape Consortium (interdisciplinary data science team including researchers at U. Wyoming, U. Nevada-Reno, and U. Montana)
- 2020–2021 Member of Remote Engagement Strategy Team, Ithaca College
- 2017–2020 Co-chair, Student Engagement Information Initiative, Ithaca College
- 2014–2017 Postdoctoral Associate, Center for Population Biology, UC Davis
- 2012–present Reviewer, National Science Foundation, *American Naturalist*, *Australian Journal of Botany*, *Ecography*, *Ecological Monographs*, *Ecology*, *Ecology Letters*, *Ecosphere*, *Functional Ecology*, *Global Ecology and Biogeography*, *Journal of Biogeography*, *Journal of Ecology*, *Journal of Vegetation Science*, *Methods in Ecology and Evolution*, *New Phytologist*, *Oecologia*, *Oikos*, *PLOS ONE*, *Axios Reviews*
- 2011–present Member and data contributor, TRY Initiative (plant trait database)
- 2014 Organizer, working group on intraspecific trait variation in plant communities, Center for Functional and Evolutionary Ecology, Montpellier, France
- 2012–2013 Vice President, Biology Graduate Student Organization, Syracuse University
- 2009–2010 Presenter, Environmental Field Days (environmental education program for Syracuse area 6th grade students), Green Lakes State Park, Fayetteville, NY