

Caroline E. Farrior, Ph.D.

CONTACT INFORMATION	University of Texas at Austin Department of Integrative Biology 2415 Speedway Stop C0930 Austin, TX 78712, USA	<i>E-mail:</i> cfarrior@utexas.edu <i>Phone:</i> +1(512)232-6922 <i>Office:</i> PAT 506A <i>Website:</i> https://farriorlab.github.io/
PROFESSIONAL POSITIONS	University of Texas at Austin Austin, Texas, USA Department of Integrative Biology <i>Associate Professor</i>	Fall 2023 – current
	University of Texas at Austin Austin, Texas, USA Department of Integrative Biology <i>Assistant Professor</i>	Fall 2016 – Summer 2023
	NIMBioS Knoxville, Tennessee, USA National Institute for Mathematical and Biological Synthesis <i>Postdoctoral Fellow</i>	2014 – 2016
	Princeton Environmental Institute Princeton, New Jersey, USA <i>Postdoctoral Research Associate</i>	2012 – 2014
EDUCATION	Princeton University Princeton, New Jersey, USA Ph.D., Ecology and Evolutionary Biology (Advisors Stephen Pacala, Simon Levin)	2007 – 2012
	University of Pennsylvania Philadelphia, Pennsylvania, USA B.A., Honors in Biology, Minor in Mathematics	2003 – 2007
HONORS AND AWARDS	Mentoring Excellence Award, College of Natural Sciences (UT Austin), 2024. Sabbatical Fellow, German Center for Integrative Biodiversity Research (iDiv), 2023 – 2024. Early Career Fellow, The Ecological Society of America, 2021 – 2025. The American Society of Naturalists, Presidential Award, 2014. National Science Foundation Graduate Research Fellowship, 2009 – 2012. Princeton Energy and Climate Scholar, 2009 – 2011. University of Pennsylvania, University Scholar, 2003 – 2007.	
PUBLICATIONS	Cinoğlu, D., R.R. Decker, , N. Rüger, C.E. Farrior . <i>In preparation</i> Small disturbances and subsequent competition for light can maintain a diversity of demographic groups in a Neotropical forest. Decker, R.R., Cinoğlu, D., and C.E. Farrior . <i>In preparation</i> . Stochastic forest gaps and competition for light can drive deterministic niche differentiation among species. Lichstein, J., T. Zhang, E. Weng, C.E. Farrior , R. Dybzinski, S. Malyshev, E. Shevliakova, R. Birdsey, S.W. Pacala. 2024. Effects of water limitation and competition on tree carbon allocation in an Earth system modeling framework. <i>Journal of Ecology</i> . DOI: 10.1111/1365-2745.14416	

PUBLICATIONS
CONTINUED

Schorn, M., S. Kamback, R.L. Chazdon, D. Craven, **C.E. Farrior**, J.A. Meave, R. Muñoz, M. van Breugel, et al. 2024. Tree demographic strategies largely overlap across succession in Neotropical wet and dry forest communities. *Ecology* 105(7):e4321.

van Breugel, M., F. Bongers, N. Norden, J.A. Meave, L. Amissah, W. Chathorn, R. Chazdon, D. Craven, **C. Farrior**, et al. 2024. Feedback loops drive ecological succession: towards a unified conceptual framework. *Biological Reviews* 99, 928–949.

Mueller, U.G., A.G. Himler, **C.E. Farrior**. 2023. Life history, nest longevity, and nest architecture of the fungus-growing ant *Mycetosoritis hartmanni* (Formicidae: Attina). *PLOS One* 18(7), e0289146.

Rüger, N., M. Schorn, S. Kamback, R. Chazdon, **C.E. Farrior**, J.A. Meave, R. Munozviles, M. van Breugel, et al. 2023. Successional shifts in tree demographic strategies in wet and dry tropical forests. *Global Ecology and Biogeography* 10.1111/geb.13669.

Francis, E.J., J.A. Lutz, and **C.E. Farrior**. 2023. Elevated mortality of large trees creates space for canopy dominance of intermediate trees: a hypothesis of temperate forest dynamics supported by model-data comparison. *Forest Ecology and Management* 540(121035).

Ohse, B., A. Compagnoni, **C.E. Farrior**, S.M. McMahon, R. Salguero-Gomex, N. Rüger, and T.M. Knight. 2023. Demographic synthesis for global tree species conservation. *Trends in Ecology and Evolution* doi.org/10.1016/j.tree.2023.01.013.

Weng, E., I. Aleinov, R. Singh, M.J. Puma, S.S. McDermid, N.Y. Kiang, M. Kelley, K. Wilcox, R. Dybzinski, **C.E. Farrior**, S.W. Pacala, and B.I. Cook. 2022. Modeling demographic-driven vegetation dynamics and ecosystem biogeochemical cycling in NASA GISS's Earth system model (ModelE-BiomeE v.1.0). *Geoscientific Model Development* 15(22)8153–8180.

Poorter, L., D. Craven, C.C. Jakovac, M.T. van der Sande, L. Amissah, F. Bongers, R. Chazdon, **C.E. Farrior**, et al. 2021. Multidimensional tropical forest recovery. *Science* 374(6573)1370–1376.

Rakowski, C.J., **C.E. Farrior**, S.R. Manning, and M.A. Leibold. 2021. Predator complementarity dampens variability of phytoplankton biomass in a diversity-stability trophic cascade. *Ecology* doi:10.1002/ecy.3534.

Phillips, Z.I., L. Reding, and **C.E. Farrior**. 2021. The early life of a leaf-cutter ant colony constrains symbiotic vertical transmission and favors horizontal transmission. *Ecology and Evolution* 11:11718–11729.

Northup, A.P., T.H. Keitt, **C.E. Farrior**. 2021. Cavitation-resistant junipers cease transpiration earlier than cavitation-vulnerable oaks under summer dry conditions. *Ecohydrology* doi:10.1002/eco.2337.

PUBLICATIONS
CONTINUED

Crawford, M.S, K.E. Barry, A.T. Clark, **C.E. Farrior**, J. Hines, E. Ladouceur, J.W. Lichstein, I. Maréchaux, F. May, A.S. Mori, B. Reineking, L.A. Turnbull, C. Wirth, and N. Rüger. 2021. The function-dominance correlation drives the direction and strength of biodiversity-ecosystem functioning relationships. *Ecology Letters* 24(9):1762–1775.

Reiskind, M.O.B, M.L. Moody, D.I. Bolnick, C.T. Hanifin, **C.E. Farrior**. 2021. Nothing in evolution makes sense except in the light of biology. *BioScience* 71(4):370–383.

Franklin, O., S.P. Harrison, R. Dewar, **C.E. Farrior**, Å. Brännström, U. Dieckmann, S. Pietsch, D. Falster, W. Cramer, M. Loreau, H. Wang, A. Mäkelä, K. T. Rebel, E. Meron, S. J. Schymanski, E. Rovenskaya, B.D. Stocker, S. Zaehle, S. Manzoni, M. Van Oijen, I.J. Wright, P. Ciais, P.M. van Bodegom, J. Peñuelas, F. Hofhansl, C. Terrer, N.A. Soudzilovskaia, G. Midjley, and I.C. Prentice. 2020. Organizing principles for vegetation dynamics. *Nature Plants* 6:444–453.

Rüger, N. Condit, R., D.H. Dent, S.J. DeWalt, S.P. Hubbell, J.W. Lichstein, O.R. Lopez, C. Wirth, and **C.E. Farrior**. 2020. Demographic trade-offs predict tropical forest dynamics. *Science* 368(6487):165–168.

Lu, Yaojie, R.A. Duursma, **C.E. Farrior**, B.E. Medlyn, and X. Feng. 2020. Optimal stomatal drought response shaped by competition for water and hydraulic risk can explain plant trait covariation. *New Phytologist* 225(3):1206–1217.

Farrior, C.E., 2019. Theory predicts plants grow roots to compete with only their closest neighbours. *Proceedings of the Royal Society, B*. 286:20191129.

Weng, E., R. Dybzinski, **C.E. Farrior**, and S.W. Pacala. 2019. Competition alters predicted forest carbon cycle responses to nitrogen availability and elevated CO₂: Simulations using an explicitly competitive, game-theoretic vegetation demographic model. *Biogeosciences* 16(23):4577–4599.

Beckage, B., G. Bucini, L.J. Gross, W.J. Platt, S.I. Higgins, N.L. Fowler, M.G. Slocum, and **C. Farrior**. 2019. Water limitation, fire, and savanna persistence: A conceptual model. In P.F. Scogings and M. Sankaran (Eds) *Savannas Woody Plants and Large Herbivores* Wiley. West Sussex, UK. 645–659.

Dybzinski, R., A. Kelvakis, J. McCabe, S. Panock, K. Anuchitlertchon, L. Vasarhelyi, M.L. McCormack, G.G. McNickle, H. Poorter, C. Trinder, and **C.E. Farrior**. 2019. How are nitrogen availability, fine-root mass, and nitrogen uptake related empirically? Implications for models and theory. *Global Change Biology* 25(3):885–899.

Fisher, R.A., C.D. Koven, W.R.L. Anderegg, B.O. Christoffersen, M.C. Dietze, **C.E. Farrior**, J.A. Holm, G. Hurtt, R.G. Knox, P.J. Lawrence, J.W. Lichstein, M. Longo, A.M. Matheny, D. Medvigy, H.C. Muller-Landau, T.L. Powell, S.P. Serbin, H. Sato, J. Shuman, B. Smith, A.T. Trugman, T. Viskari, H. Verbeeck, E. Weng, C. Xu, X. Xu, T. Zhang, and P. Moorcroft, 2018. Vegetation demographics in Earth System Models: A review of progress and priorities. *Global Change Biology* 24(1):35–54.

PUBLICATIONS
CONTINUED

Weng, E., **C.E. Farrior**, R. Dybzinski, and S.W. Pacala, 2017. Predicting vegetation type through physiological and environmental interactions with leaf traits: evergreen and deciduous forests in an earth system modeling framework. *Global Change Biology* 23(6):2482–2498.

Farrior, C.E., S.A. Bohlman, S. Hubbell, and S.W. Pacala, 2016. Dominance of the suppressed: Power law size structure in tropical forests. *Science* 351:155–157.

Weng, E., S. Malyshev, J.W. Lichstein, **C.E. Farrior**, T. Zhang, E. Shevliakova, and S.W. Pacala, 2015. Scaling from individual trees to forests in an Earth system modeling framework using a mathematically tractable model of height-structured competition. *Biogeosciences* 12:2655–2694.

Farrior, C.E., I. Rodriguez-Iturbe, R. Dybzinski, S.A. Levin, and S.W. Pacala, 2015. Decreased water limitation under elevated CO₂ amplifies potential for forest carbon sinks. *PNAS* 112:7213–7218.

Dybzinski, R., **C.E. Farrior**, and S.W. Pacala, 2015. Increased forest carbon storage with increased atmospheric CO₂ despite nitrogen limitation: a game theoretic model of carbon and nitrogen allocation strategies for trees in competition for nitrogen and light. *Global Change Biology* 21:1182–1196.

Farrior, C.E., 2014. Competitive optimization models, attempting to understand the diversity of life. *New Phytologist* 203:1025–1027.

Farrior, C.E., D. Tilman, R. Dybzinski, P.B. Reich, and S.W. Pacala, 2013. Resource limitation in a competitive context determines complex plant responses to experimental resource additions. *Ecology* 94:2505–2517.

Dybzinski, R., **C.E. Farrior**, S. Ollinger, and S. Pacala, 2013. Interspecific versus intraspecific patterns in leaf nitrogen of forest trees across nitrogen availability gradients. *New Phytologist* 200:112–121.

Farrior, C.E., R. Dybzinski, S.A. Levin, and S.W. Pacala, 2013. Competition for water and light in closed-canopy forests: a tractable model of carbon allocation with implications for carbon sinks. *The American Naturalist* 181:314–330.

*Received the American Society of Naturalists' Presidential Award for the best paper published in the journal in 2013

Dybzinski, R., **C.E. Farrior**, A. Wolf, P.B. Reich, S.W. Pacala, 2011. Evolutionarily stable strategy carbon allocation to foliage, wood, and fine roots in trees competing for light and nitrogen: An analytically tractable, individual-based model and quantitative comparisons to data. *The American Naturalist* 177:153–166.

SELECTED
INVITED
PRESENTATIONS

Banff International Research Station. Dynamical Models Inspired by Biology. 5-day workshop. Banff, Canada. 9 Oct, 2024.

Helmholtz-Centre for Environmental Research (UFZ). Department of Ecological Modelling. Leipzig, Germany. 22 May, 2024.

SELECTED
INVITED
PRESENTATIONS
CONTINUED

Universität Leipzig. Systematic Botany and Functional Biodiversity with Molecular Evolution and Systematics of Plants – Research Seminar. Leipzig, Germany. May 15, 2024.

Max Planck Institute for Biogeochemistry. Institute-wide Seminar. Jena, Germany. March 11, 2024.

German Center for Integrative Biodiversity Research (iDiv). Institute-wide Seminar. Leipzig, Germany. January 18, 2024.

University of Wyoming, Botany Department. Laramie, WY. November 3, 2022.

Colorado State University, Department of Biology. Fort Collins, CO. April 19, 2022.

ETH Zurich, Computational Ecosystem Science Seminars. Zoom. January 13, 2022.

Zurich-Basel Plant Sciences Center, Patterns in Nature and Plant Sciences. Zoom. December 8, 2021.

University of Maryland, Behavior, Ecology, Evolution, and Systematics Seminar Series. Zoom. April 26, 2021.

Michigan State University, Kellogg Biological Station Seminar Series. Zoom. October 9, 2020.

German Center for Integrative Biodiversity Research (iDiv). Public seminar Series. Leipzig, Germany. December 18, 2019.

Energy@UT, Mindbenders. Austin, Texas. October 2, 2019.

Stanford University, Carnegie Institute. Palo Alto, California. October 22, 2018.

University of Minnesota, Plant and Microbial Biology. St. Paul, Minnesota. February 20, 2018.

*Graduate student invited speaker.

Pennsylvania State University, Department of Biology. State College, Pennsylvania. October 31, 2017.

Rice University, BioScience Departmental Seminar Series. Houston, Texas. October 2, 2017.

International Institute for Applied Systems Analysis. *Dynamic Vegetation Models: The Next Generation*. Vienna, Austria. March 27, 2017.

National Center for Atmospheric Research *Ecosystem Demographics in the Earth System*. Boulder, Colorado. January 19, 2016.

Wageningen University and Research Center. Wageningen, Netherlands. January 12, 2016.

Utrecht University. Utrecht, Netherlands. January 11, 2016.

Howard University, Department of Mathematics Colloquium. September, 25 2015.

Umeå University. Umeå, Sweden. March 12, 2014.

FUNDING

National Science Foundation. Sole PI. *CAREER: Tropical to temperate forest dynamics and their potential influences on plant performance strategies, a theory-data fusion approach.*

(\$898,920) 2023 – 2028.

National Science Foundation. Sole PI. *EAGER: Explaining species coexistence from first principles of Ecology.*

(\$398,623) 2019 – 2024.

Energy Institute of the University of Texas at Austin and ExxonMobil. co-Lead PI. *Linking plant strategies to complex subsurface hydrology to predict ecosystem carbon storage across Texas.*

(\$572,346) 2020 – 2023.

Stengl–Wyer Endowment Grant. co-PI. *Probing the mechanisms of enhanced ecosystem functioning from diversity: resource acquisition, trophic interactions, and phylogenetic diversity within plant communities.*

(\$88,290) 2021 – 2023.

Dr. Cecile Dewitt-Morette France-UT Endowed Excellence Fund, French Embassy.

PI. *Leaf and wood dimensions: Understanding tropical forest diversity by integrating data and mechanistic models.*

(\$22,989) 2019 – 2020.

TEACHING
EXPERIENCE

University of Texas at Austin Austin, Texas

Instructor Fundamentals of Ecology, Graduate Level. Fall 2023.

Instructor Theoretical Ecology, Graduate Level. Fall 2020. Spring 2023.

Instructor Ecology, Undergraduate Level. Fall 2016-2018, Fall 2020, Fall 2022, Fall 2024.

Instructor Population Biology Seminar, Graduate Level. Spring 2020.

Co-Instructor Subjects and Skills in Ecology, Evolution and Behavior II, Graduate Level. Spring 2018, Spring 2019.

Graduate Advising

Soh Sun Yi, Ecology, Evolution and Behavior, UT Austin. 2024 – current.

Saismit Naik, Ecology, Evolution and Behavior, UT Austin. 2024 – current.

– Co-advised by Annette Ostling.

Charlotte Reemts, Plant Biology, UT Austin. 2021 – current.

– Co-advised by Amy Wolf.

Xinyi Yan, Ecology, Evolution and Behavior, UT Austin. 2020 – current.

– Co-advised by Amy Wolf.

Damla Cinoğlu, Ecology, Evolution and Behavior, UT Austin. 2019 – current.

Devin Grobert, Plant Biology, UT Austin. 2019 – current.

– Co-advised by Norma Fowler.

Chase Rakowski, Ecology, Evolution and Behavior, UT Austin. Ph.D. 2023.

– Co-advised by Mathew Leibold.

– Dissertation title: *Exploring new varieties and applications of trophic cascades using pond species interaction experiments and theory.*

Alison Northup, Ecology, Evolution and Behavior, UT Austin. Ph.D. 2021.

– Co-advised by Tim Keitt.

– Dissertation title: *Modern analyses of complex datasets in plant ecology and conservation.*

Shankari Subramaniam, Ecology, Evolution and Behavior, UT Austin. M.A. 2019.

– Dissertation title: *Dispersal evolution in a community context.*

Wenying Liao, Visiting student, Princeton U. 2018.

– Project title: *Competition for water and nitrogen in deciduous and evergreen plants explains the global pattern of symbiotic fixation along rainfall gradients.*

TEACHING
CONTINUED

Graduate Advising, Continued

Yaojie Lu, Graduate Student Fellow, NIMBioS. 2015.

– Project title: *Competitive stomatal behaviour.*

Postdoctoral Advising

Ravi Ranjan. 2024 – current.

Robin Decker. 2019 – current.

Tom Bytnerowicz, Stengl Wyer Scholar. 2020 – 2023.

– Current position: Postdoctoral Fellow, Wolf Lab.

Dana Chadwick, Research Associate. 2021 – 2021.

– Current position: Research Scientist, NASA Jet Propulsion Laboratory.

Emily Francis. 2019 – 2021.

– Current position: Postdoc, Hurteau Lab, University of New Mexico.

Claire Fortunel, Research Associate. 2017 – 2018.

– Current position: Research Scientist, UMR AMAP IRD, Montpellier.

Undergraduate Research Advising

Avery Dyson, UT Austin. 2023 – 2024.

Mandy Tran, UT Austin. 2022 – 2023.

Emma Rust, Angelo State University, InSTInCT REU program, UT Austin. 2022 – 2023.

Matthew Bradley, UT Austin. 2021 – 2022.

– Project title: *Evaluating Janzen-Connell dynamics as a potential driver of evolutionarily stable coexistence.*

Sarah Ortiz, UT Austin. 2017 – 2019.

– Project title: *Testing potential for stable coexistence between two species, one capable of nitrogen fixation and one not*

Lucile Jarry, Princeton U. 2011 – 2012.

Robin Eng, University of Pittsburgh. 2011 – 2012.

SERVICE AND
OUTREACH

AI/Data Science in Environmental Research, Proposal to the Provost and Search Committee Co-Chair. 2024.

ForestGeo Summer Analytical Workshop, Mentor. 2024

Integrative Biology Code of Conduct Development, Committee Chair. 2023 – current.

SAGES, UT Austin, Mentor. 2021 – 2023.

Theoretical Ecology Section of the Ecological Society of America, Mentor. 2020 – current.

Theoretical Ecology Section of the Ecological Society of America, Student Presentation Judge. 2016 – 2021.

High School Research Initiative. 2020 – 2021.

Designed and led a training for local high school teachers.

Bridging Disciplines Mentor, UT Austin. 2017 – 2019.

NIMBioS Casual Seminar Series, Founder and organizer. 2014 – 2016.

Adventures in STEM Camp, volunteer. NIMBioS and CURRENT. 2015.

Planting Science Mentor. 2013 – 2014.

Women in Science Graduate Mentor. Princeton, NJ. 2008 – 2009.

REVIEWER

Journals: American Naturalist, Biogeosciences, Ecology Letters, Ecological Modelling, Ecological Monographs, Ecology, Ecosystems, Geoscientific Model Development, Journal of Ecology, Nature Ecology and Evolution, Nature Communications, New Phytologist, Oecologia, Plant and Soil, Proceedings of the National Academy of Sciences, Proceedings of the Royal Society B, Science, Theoretical Ecology, and Tree Physiology.

Funding Agencies: National Science Foundation, US-Israel Binational Science Foundation, CONTEX.

ADDITIONAL
TRAINING

Complex Systems Summer School, Santa Fe Institute. June 2009.

Probability Summer School, Cornell University. June 2008.

Cedar Creek Ecosystem Science Reserve, Minnesota. Intern (Tilman). Summers 2004, 2005, 2007.

Smithsonian Tropical Research Institute, Panama. Intern (Schnitzer and Muller-Landau). Winter and Summer 2006.