

Nathan Garrick Swenson
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Education & Training

Ph.D. 2008. Ecology and Evolutionary Biology (Minor in Global Change). University of Arizona, Tucson, Arizona, U.S.A.
Dissertation: *The Influence of Phylogenetic and Functional Similarity on Species Coexistence Through Space and Time.*

M.Sc. 2004. Biology. New Mexico State University, Las Cruces, New Mexico, U.S.A.
Thesis: *The Geography and Physiology of Hybridization, Hybrid Zones, and Species Range Boundaries.*

B.A. 2001. Biology. St. Olaf College, Northfield, Minnesota, U.S.A.

Academic & Research Positions

Professor, 2021 – Present, Department of Biological Sciences, University of Notre Dame.

Martin J. Gillen Director, 2021 – Present, University of Notre Dame Environmental Research Center.

Professor, 2018 – 2020, Department of Biology, University of Maryland.

Associate Professor (with tenure), 2015 – 2018, Department of Biology, University of Maryland.

Associate Professor (with tenure), 2014 – 2015, Department of Plant Biology, Michigan State University.

Assistant Professor, 2009 – 2014, Department of Plant Biology, Michigan State University.

NSF Post-Doctoral Fellow in Bioinformatics, 2008 – 2009, Center for Tropical Forest Science – Asia Program, Arnold Arboretum, Harvard University.

Guest Faculty, 2008, Tropical Plant Systematics Course, Palo Verde and La Selva Biological Research Stations, Organization for Tropical Studies, Duke University and Universidad de Costa Rica.

Graduate Teaching Associate, 2004 – 2008, Ecology and Evolutionary Biology Department, University of Arizona.

Graduate Research Fellow, 2006, Geographic Analysis and Monitoring Program, United States Geological Survey.

Research Associate, 2004, Laboratory for Ecological and Evolutionary Genetics, New Mexico State University.

Graduate Research Fellow, 2003 – 2004, Los Alamos National Laboratory.

Graduate Teaching Assistant, 2002 – 2003, Department of Biology, New Mexico State University.

Field Research Technician, 2001 – 2002. Luquillo Forest Dynamics Plot, Institute for Tropical Ecosystem Studies, University of Puerto Rico.

Academic Awards & Honors

Elected Fellow, 2026, Ecological Society of America (ESA), (*‘For outstanding contributions to a wide range of fields served by ESA, including, but not restricted to, those that advance or apply ecological knowledge in academics, government, non-profit organizations and the broader society’*).

Elected Fellow, 2024, American Association for the Advancement of Science (AAAS), (*‘For distinguished contributions in elucidating the drivers of the structure, diversity and dynamics of forest tree communities’*).

Highly Cited Researcher, 2018, (*‘The list recognizes world-class researchers for their exceptional research performance, demonstrated by production of multiple highly cited papers that rank in the top 1 by citations for field and year in ISI Web of Science’*). Clarivate Analytics. Category: Cross-Field.

John Harper Prize, 2017. (*‘Given each year to the best paper in the Journal of Ecology by an early career author’* [Zambrano]). British Ecological Society, Lead Author: Jenny Zambrano. Senior Author: Nathan Swenson.

Guggenheim Fellow, 2014. (*‘Guggenheim Fellowships are intended for men and women who have already demonstrated exceptional capacity for productive scholarship or exceptional creative ability in the arts’*). John Simon Guggenheim Memorial Foundation, Field of Study: Plant Sciences.

Ebbe Nielsen Prize, 2012. (*‘Awarded annually to a researcher in the early stages of their career who combines biosystematics and biodiversity informatics research in novel ways’*). Global Biodiversity Information Facility.

Michigan State University Nominee for Packard Fellowship in Science and Engineering, 2012.

Jasper Loftus-Hills Young Investigators Award, 2011, (*‘Recognizes outstanding and promising work by investigators who received their doctorates in the preceding three years’*). American Society of Naturalists.

Invited Speaker 5th Annual Early Career Scientists Symposium: “Using Phylogenies in Ecology”, 2009, University of Michigan.

Award in Tropical Botany (*‘Established to promote the preservation of tropical forests by enlarging the body of botanists with field experience’*), 2008, The Garden Club of America and The World Wildlife Fund.

Robert W. Hoshaw Memorial Award (*Highest departmental honor for University of Arizona Ecology and Evolutionary Biology graduate students*), 2007, Ecology and Evolutionary Biology, University of Arizona.

Galileo Circle Scholar Award (*Given to University of Arizona’s ‘finest graduate student scientists’*), 2007, College of Science, University of Arizona.

Earth Fellowship (*Given to top incoming PhD students pursuing a minor in Global Change*), 2005-2006, Institute for the Study of Planet Earth, University of Arizona.

Outstanding Graduate Student Award (*Given to top graduate student in the U.S. Mountain West Region incorporating geospatial information and technology in their research*), 2003, Geospatial Information and Technology Association.

Grants & Fellowships

National Aeronautics and Space Administration, 2022-2025, Title: "*Transcriptomics from space: linking remote sensing in tree gene expression in a diverse set of species through the growing season and in response to water deficit.*" PI: Nathan Swenson

National Science Foundation, 2020-2025, Title: "*Dimensions US-China: Integrating the dimensions of biodiversity to understand tree performance in a changing world.*" PI: Nathan Swenson.

National Science Foundation, 2020-2021, Title: "*Collaborative Research: RAPID: Forest Productivity and Expression in a Low-Emission Present: A RAPID Response to the COVID-19 Emissions Reduction Event.*" PI: Melissa McCormick, Co-PI, Nathan Swenson

Arnold Arboretum Genomics Initiative, Harvard University, 2018, Title: "*A hybrid genome assembly and tissue-specific expression in a parthenocarpic maple – Acer griseum (Franchet) Pax.*". PI: Nathan Swenson.

National Science Foundation, 2018-2019, Title: "*RAPID: Priority Effects, Functional Differentiation, and Negative Density Dependence as Drivers of Post-Hurricane Seedling Dynamics.*" PI: Nathan Swenson.

National Science Foundation, 2016-2020, Title: "*MSB-ENSA: Forest Function from Genes to Canopies: Disentangling the Fine Scale Spatio-Temporal Variation in Gene Expression and Tree Growth.*" PI: Nathan Swenson. Co-PIs: Sean McMahon, Stuart Davies

National Science Foundation, 2016-2018, Title: "*Integrating Functional, Phylogenetic and Genetic Components of Diversity for an Improved Understanding of Forest Structure, Dynamics, and Change.*" PI: Stuart Davies. Co-PIs: Nathan Swenson, Helene Muller-Landau, Liza Comita, F. Andrew Jones

- National Science Foundation, 2015-2017, Title: "*Dissertation Research: Disentangling the Influence of Functional Similarity on Patterns of Species Abundance in Tree Communities*". PI: Nathan Swenson (DDIG written by and supporting Ph.D. student Maria Natalia Umana)
- National Science Foundation, 2013-2016, Title: "*ABI Innovation: Phylogenetic Methods for Imputing Missing Plant Trait Values in Global Databases*". PI: Nathan Swenson.
- National Science Foundation, 2013-2018, Title: "*Dimensions US-China: Disentangling the Components of Tree Biodiversity: Integrating Phylogenies, Functional Traits and Transcriptomes*". PI: Nathan Swenson
- National Science Foundation, 2011-2016, Title: "*LTREB: Long-Term Studies of Flowering, Fruiting and Seedling Recruitment in Neotropical Forests: Global Change, Climate Variability and Mechanisms of Species Coexistence*". PI: Nancy Garwood. Co-PIs: Margaret Metz, Helene Muller-Landau, S. Joseph Wright, Renato Valencia, Jess Zimmerman, Nathan Swenson, Jill Thompson and Maria Uriarte.
- National Science Foundation, 2011-2014, Title: "*Collaborative Research: Modeling Successional Vegetation Dynamics in Wet Tropical Forests at Multiple Scales: Integrating Neighborhood Effects, Functional Traits, and Phylogeny*". PI: Maria Uriarte. Co-PIs: Robin Chazdon, Nathan Swenson and Jess Zimmerman.
- National Science Foundation, 2010-2015, Title: "*Dimensions IRCN: Diversity and Forest Change: Characterizing Functional, Phylogenetic and Genetic Contributions to Diversity Gradients and Dynamics in Tree Communities*". PI: Stuart Davies. Co-PIs: Richard Condit, W. John Kress, Helene Muller-Landau and Nathan Swenson.
- National Science Foundation Post-Doctoral Fellowship in Bioinformatics, 2008-2009, Center for Tropical Forest Science - Asia Program, Arnold Arboretum, Harvard University. Title: "*Phylogenetic Diversity and Turnover in Tropical Forests: Discerning the Role of Ecological, Biogeographic and Evolutionary Processes*".
- Post-Doctoral Fellowship, 2008-2010, National Center for Ecological Analysis and Synthesis, University of California - Santa Barbara. (*Declined*).
- Biodiversity Collections Travel Grant, 2008, Bio5 Institute, University of Arizona. Title: "*An Inventory of the Phylogenetic and Functional Diversity in a Costa Rican Montane Rain Forest*".
- CTFS Research Grant, 2007-2008, Center for Tropical Forest Science, Smithsonian Tropical Research Institute. Title: "*Life-History, Functional Diversity and the Post-Hurricane Dynamics of a Forest Plot*".
- Dissertation Improvement Grant, 2007, Institute for the Study of Planet Earth, University of Arizona.
- Graduate Research Fellowship, 2006, Geographic Analysis and Monitoring Program, United States Geological Survey, Tucson, Arizona.

Rexford Daubenmire Scholarship, 2005-2006, Organization for Tropical Studies, Duke University and Universidad de Costa Rica.

Foreign Language Area Scholarship, 2005, Center for Latin American Studies, University of Arizona and Universidade Federal do Ceara, Brasil. (*Declined*).

Graduate Research Fellowship, 2003-2004, Los Alamos National Laboratory.

Grant-in-Aid-of-Research, 2003, Sigma Xi: The Research Society.

Collaborator Named on Foreign Grants

Spanish Ministry of the Economy, 2016-2019, Title: "*Analisis Multiescalar de los Patrones de Distribucion y Dominancia de Plantas Leñosas en los Bosques de Tierra Firme del Noroeste de la Amazonia*". PI: Manuel Macía. External Scientific Collaborator: Nathan Swenson

Spanish Ministry of the Economy, 2014-2017, Title: "*Determinantes de la Diversidad Funcional y Filogenética que Explican la Distribución de las Plantas Leñosas en los Bosques Andinotropicales a lo Largo de Gradientes Altitudinales y Latitudinales*". PI: Luis Cayuela. Co-PIs: Manuel Macía, Iñigo Granzow. External Scientific Collaborator: Nathan Swenson

Publications (ISI Search: au = swenson ng OR DO = 10.1111/j.1365-2486.2011.02451.x)

197. Kambach, S., U. Jandt, A.T. Rosario Ocosta, J.M. Alvarez-Martinez, I. Axmanova, M. Bazzichetto, E. Bergmeier, M. Bernhardt-Romermann, I. Biurrun, M. Carboni, M. Bergmann Carlucci, M.L. Carranza, B.E.L. Cerabolini, A. Chiarucci, M. Chytry, G. Damasceno, J. Dengler, M. De Sanctis, J. Divisek, J. Dolezal, S. Dillinger, F. Essl, K. Friesova, V. Fontana, E. Garbolino, M. Glaser, M. Gonzales-Robles, B. Guler, G.J.A. Hahn, M. Hajek, T. Hruska, E. Illa, F. Jansen, S. Jansen, A. Jentsch, B. Jimenez-Alfaro, W.D. Kissling, I. Knollova, G. Losapio, U. Liu, J. Lenoir, F. Lens, B. Lenzner, A. Perea Martos, L. Mendez, J. Messier, A.S. Mori, F. Napoleone, R. Norum, A. Novakovskiy, R. Ornstein, R.J. Pakeman, J. Penuelas, P. Petrik, R. Pielech, B.X. Pinho, P. Poschlod, V. Rasomavicius, C. Roscher, C. Rossi, F.M. Sabatini, B. Sandel, D. Schellenberger Costa, W. Schmidt, S. Sheremetiev, T.A. Shovon, M.J. Spasojevic, N.G. Swenson, G. Swacha, R. Tarifa, L. Tichy, M. Tomaselli, A. Valdes, K. Van Meerbeek, V. Vandvik, K. Vassilev, M. Vecera, E. Weiher, T. Wohlgemuth and H. Bruelheide. In Press. Habitat-specific trends in taxonomic, functional and phylogenetic diversity in European plant communities over the past century. **Nature Communications**.

196. Senevirathne, C.K., A. Huff, D. Datta, N.G. Swenson and A.V. Rocha. In Press. Forest health, heart rot disease, and their impact on the source of carbon-based greenhouse gas fluxes. **New Phytologist**.

195. Sun, Z., N. Prachanun, A. Sonsuth, A. Nathalang, W. Chanthorn, W.Y. Brockelman, R. Gu, N.G. Swenson and L. Lin. 2025. Lianas exhibit stronger conspecific negative

density dependence than trees on tropical seedling survival. **Ecology** 106:e70210.

194. Chen, Y., L. Monks, V.E. Rubio, A.J. Cox and N.G. Swenson. 2025. Linking leaf hyperspectral reflectance and gene expression. **Communications Earth and Environment**. 6:694.

193. Dong, T., F. Wu, Y. Tsujii, P. Townsend, N. Yang, W. Xu, S. Liu, N.G. Swenson, J. Lamour, W. Han, N. Smith, Y. She, L. Yan, D. Tian, M. Jiang, Z. Wang, X. Liu, G. Dai, J. Dong, J. Sardans, P.B. Reich, H. Lambers, S. Serbin, J. Penuelas, J. Wu, and Z. Yan. 2025. Deciphering the variability in leaf phosphorus-allocation strategies using leaf economic traits and reflectance spectroscopy across diverse forest types. **New Phytologist**. 247:1129-1144.

192. Gonzalez, H., A. O'Neill, M. Parent, D. Datta, and N.G. Swenson. 2025. The frequency, magnitude and spatial distribution of heart rot in dominant temperate tree species in a forest dynamics plot. **Ecology and Evolution**. 15:e71329.

191. He, Y.Y., R. Junker, J. Xiao, J. Lasky, M. Cao, M. Asefa, N.G. Swenson, J. Dong, G. Xu, J. Yang, and B. Sedio. 2025. Genetic and environmental drivers of infraspecific variation in foliar metabolites in a tropical tree community. **New Phytologist** 246:2551-2564.

190. Shao, X., Z. Yao, M. Chatterjee, X. Ge, L. Jin, F. Liu, G. Cao, M. Cao, L. Lin, and N.G. Swenson. 2025. Integrated effects of neighborhood composition and resource levels on growth of a dominant tree species in a tropical forest. **Proceedings of the Royal Society B**. 292:20242373.

189. Datta, D., S.J Worthy, J. Liu, Z. Zheng, M. Cao, J. Yang, and N.G. Swenson. 2025. Cavities and the demographic performance of tropical rainforest trees. **Ecology Letters** 28:e70091.

188. Wu, F.; S. Liu, J. Lamour, O. Atkin, N. Yang, T. Dong, W. Xu, N. Smith, Z. Wang, H. Wang, Y. Su, X. Liu, Y. Shi, A. Xing, G. Dai, J. Dong, N.G. Swenson, J. Kattge, P.B. Reich, S. Serbin, A. Rogers, J. Wu, and Z. Yan. 2025. Linking leaf dark respiration to leaf traits and reflectance spectroscopy across diverse forest types. **New Phytologist**. 246:481-497.

187. Gome, L.D., J. Aguirre-Gutierrez, F. Souza, N.G. Swenson, N.J.B. Kraft, B. Marimon, T. Baker, R. Lima, E. Villanova, E. Alvarez-Davila, A. Monteagudo-Mendoza, G. Flores-Llampazo, R. dos Santos, G. Boenisch, A. Araujo-Murakami, G.F. Rivas-Torres, H. Ramirez-Flore, B.H. Marimon-Junior, T. Feldpausch, Y. Malhi, O. Phillips, D. Galbraith and S. Diaz. 2025. Use and misuse of trait imputation in ecology, the problem of using out-of-context imputed values. **Ecography** 2025:e07520.

186. Kambach, S., H. Bruelheide, L.S. Comita, R. Condit, S.J. Wright, S. Aguilar, C.H. Chang-Yang, Y.Y. Chen, N.C. Garwood, S.P. Hubbell, P.J. Luo, M.R. Metz, M.B.

Nasardin, R. Perez, S.A. Queenborough, I.F. Sun, N.G. Swenson, J. Thompson, M. Uriarte, R. Valencia, T.L. Yao, J.K. Zimmerman and N. Ruger. 2025. Putting seedlings on the map: trade-offs in demographic rates between ontogenetic size-classes in five tropical forests. **Ecology** 106:e4527.

185. Yang, J. and N.G. Swenson. 2025. Plant functional geography: a reemerging field informing community assembly and ecosystem modeling research. In Kumar, M, R.W. Bussman, and N.G. Swenson (eds.), Pages 29-52, **Plant Functional Traits: Linking Climate and Ecosystem Functioning**. Elsevier Press.

184. Kumar, M., R.W. Bussmann. 2025. Plant functional traits: the scientific basis and their significance in studying climate change impacts and ecosystem functioning. In Kumar, M, R.W. Bussman, and N.G. Swenson (eds.), Pages 1-12, **Plant Functional Traits: Linking Climate and Ecosystem Functioning**. Elsevier Press.

183. Swenson, N.G. and V.E. Rubio. 2025. The functional underpinnings of tropical forest dynamics - functional traits, groups and unmeasured diversity. **Biotropica** 57:e13360.

182. Weinstein, B.G., S. Marconi, A. Zare, S.A. Bohlman, A. Singh, S.J. Graves, L. Magee, D.J. Johnson, S. Record, V.E. Rubio, N.G. Swenson, P. Townsend, T.T. Veblen, R.A. Andrus and E.P. White. 2024. Individual canopy tree species maps for the National Ecological Observatory Network. **PLoS Biology** 22:e3002700.

181. Worthy, S.J., M.N. Umana, C. Zhang, L. Lin, M. Cao and N.G. Swenson. 2024. Decomposing intraspecific phenotypic variation: implications for species diversity. **Oecologia** 205:39-48.

180. Sun, L., Y.Y. He, M. Cao, X. Wang, X. Zhou, J. Yang and N.G. Swenson. 2024. Tree phytochemical diversity and herbivory are higher in the tropics. **Nature Ecology and Evolution** 8:1426-1436.

179. Sezen, U.U., J. Shue, S.J. Worthy, S.J. Davies, S. McMahon and N.G. Swenson. 2024. Leaf gene expression trajectories during the growing season are consistent between sites and years in the American beech. **Proceedings of the Royal Society B**. 291:20232338.

178. Yang, J., H. Fan, Y. He, G. Wang, M. Cao and N.G. Swenson. 2024. Functional genomics and co-occurrence in a diverse tropical tree genus: the roles of drought- and defense-related genes. **Journal of Ecology** 112:575-589.

177. Rubio, V.E. and N.G. Swenson. 2024. On functional groups and forest dynamics. **Trends in Ecology and Evolution** 39:23-30.

176. Lu, M., M. Cao, J. Yang and N.G. Swenson. 2023. Comparative transcriptomics reveals divergence in pathogen response gene families amongst twenty forest tree species. **G3: Genes, Genomics and Genetics** 13:jkad233.
175. Wang, X., Y. He, B.E. Sedio, L. Jin, X. Ge, S. Glomglieng, M. Can, J. Yang, N.G. Swenson and J. Yang. 2023. Phytochemical diversity impacts herbivory in a tropical rainforest tree community. **Ecology Letters** 26:1898-1910.
174. Metz, M., S.J. Wright, J.K. Zimmerman, A. Hernandez, S. Smith, N.G. Swenson, M.N. Umana, R. Valencia, I. Waring-Enriquez, M. Wordell, M. Zambrano and N. Garwood. 2023. Functional traits of young seedlings predict trade-offs in seedling performance in three Neotropical forests. **Journal of Ecology** 111:2568-2582.
173. Umana, M.N., J. Needham, J. Forero-Montana, C.J. Nytch, N.G. Swenson, J. Thompson, M. Uriarte and J.K. Zimmerman. 2023. Demographic trade-offs and dynamics in a hurricane-impacted tropical forest. **Annals of Botany** 131:1051-1060.
172. Swenson, N.G., J. Zambrano, R. Howe and A. Wolf. 2023. Biogeographic context is related to local scale tree demography, co-occurrence and functional differentiation. **Ecology Letters** 26:1212-1222.
171. Yang, J. and N.G. Swenson. 2023. Height and crown allometries and their relationship with functional traits: an example from a subtropical wet forest. **Ecology and Evolution** 13:e9804.
170. Diaz, S., ..., N.G. Swenson, ..., and G. Zotz (146 authors total). In press. The global spectrum of plant form and function: enhanced species-level trait dataset. **Scientific Data** 9:755.
169. Zhang, L., X. Liu, Z. Sun, W. Bu, F.J. Bongers, X. Song, J. Yang, Z. Sun, Y. Li, S. Li, M. Cao, K. Ma, and N.G. Swenson. 2022. Functional trait space and redundancy of plant communities decrease toward cold temperatures at high altitudes in southwest China. **SC Life Sciences** 65:1869-1889.
168. Wang, F., X. Mi, I. Chen, W. Xu, W. Durka, N.G. Swenson, D.J. Johnson, S.J. Worthy, J. Xue, Y. Zhu, B. Schmid, Y. Liang, and K. Ma. 2022. Differential impacts of adult trees on offspring and non-offspring recruits in a subtropical forest. **SC Life Sciences** 65:1905-1913.
167. Sezen, U.U., S.J. Worthy, M.N. Umana, S.J. Davies, S.M. McMahon, and N.G. Swenson. 2022. Comparative transcriptomics of tropical woody plants supports fast and furious strategy along the leaf economics spectrum in lianas. **Biology Open** 11:bio059184.
166. He, Y.Y., K. Srisombut, D.L. Xing, N.G. Swenson, M. Asefa, M. Can, X.Y. Song, H.D. Wen and J. Yang. 2022. Ontogenetic trait variation and metacommunity effects

influence species relative abundances during tree community assembly. **Plant Diversity** 44:360-368.

165. Zambrano, J., G. Arellano, N.G. Swenson, P.P.A. Staniczenko, J. Thompson, and W.F. Fagan. 2022. Analysis of three-dimensional species associations reveal departures from neutrality in a tropical forest. **Ecology** 103:e3681.

164. McEvoy, S., U. Sezen, A. Trouern-Trend, S. McMahon, P. Schaberg, J. Yang, J. Wegrzyn, and N.G. Swenson. 2022. Strategies of tolerance reflected in two North American maple genomes. **The Plant Journal** 109:1591-1613.

163. Rubio, V.E. and N.G. Swenson. 2022. Functional groups, determinism and the dynamics of a tropical forest. **Journal of Ecology** 110:185-196.

162. Chen, J., R.L. Chazdon, N.G. Swenson, H. Xu, and T. Luo. 2021. Drivers of soil microbial community assembly during recovery from selective logging and clear cutting. **Journal of Applied Ecology** 58:2231-2242.

161. Huang, C., S.M. Duran, K. Hu, H.J. Li, N.G. Swenson, and B.J. Enquist. 2021. Remotely sensed assessment of increasing chronic and episodic drought effects on a Costa Rican tropical dry forest. **Ecosphere** 12:e03824.

160. He, X., N.G. Swenson, and L. Lin. 2021. Functional trait space of forest passerine bird assemblages along a latitudinal gradient in China. **Trees, Forests and People** 5:e100096.

159. Pinho, B.X., M. Taberelli, C. ter Braak, S.J. Wright, V. Arroyo-Rodriguez, M. Benchimol, B.M.J. Engelbrecht, S. Pierce, P. Hietz, B.A. Santos, C.A. Peres, S.C. Muller, I.J. Wright, F. Bongers, M. Lohbeck, U. Niinemets, M. Slot, S. Jansen, D. Jamelli, R.A.F. de Lima, N.G. Swenson, R. Condit, J. Barlow, F. Slik, M.A. Hernandez-Ruedas, G. Mendes, M. Martinez-Ramos, N. Pitman, N.J.B. Kraft, N. Garwood, J.E. Guevara-Andino, D. Faria, E. Chacon, E. Mariano-Neto, V. Junior, J. Kattge, and F.P.L. Melo. 2021. Functional biogeography of Neotropical moist forests: trait-climate relationships and assembly patterns of tree communities. **Global Ecology and Biogeography** 30:1430-1446.

158. Worthy, S.J., V.E. Rubio, K. Staiger, B. Ngouajio, J. Yang and N.G. Swenson. 2021. Site-specific impacts of a major hurricane on alpha and beta diversity in tropical forest seedling communities. **Ecosphere** 12:e03651,

157. Umana, M.N., M. Cao, L. Lin, N.G. Swenson, and C. Zhang. 2021. Trade-offs in above and below ground biomass allocation influencing seedling growth in a tropical forest. **Journal of Ecology** 109:1184-1193.

156. Rubio, V.E., J. Zambrano, Y. Iida, M.N. Umana and N.G. Swenson. 2021. Improving predictions of tropical tree survival and growth by incorporating measurements of whole leaf allocation. **Journal of Ecology** 109:1331-1343.
155. Umana, M.N., N.G. Swenson, P. Marchand, M. Cao, L. Lin and C. Zhang. 2021. Relating leaf traits to seedling performance in a tropical forest: building a hierarchical functional framework. **Ecology** 102:e03385.
154. Davies, S.J., ..., N.G. Swenson, ..., and D. Zuleta (158 Authors Total). 2021. ForestGEO: Understanding forest diversity and dynamics through a global observatory network. **Biological Conservation** 253:108907
153. Umana, M.N., G. Arellano, N.G. Swenson, and J. Zambrano. 2021. Tree seedling trait optimization and growth in response to local-scale soil and light availability. **Ecology** 102:e03252.
152. Song, X., J. Yang, M. Cao, L. Lin, Z. Sun, H. Wen. and N.G. Swenson. 2021. Traits mediate a tradeoff in seedling growth response to light and conspecific density in a diverse subtropical forest. **Journal of Ecology** 109:703-713.
151. Yang, J., X. Song, J. Zambrano, Y. Chen, M. Cao, X. Deng, W. Zhang, X. Yang, G. Zhang, Y. Tang, and N.G. Swenson. 2021. Intra-specific variation in tree growth responses to neighborhood composition and seasonal drought in a tropical forest. **Journal of Ecology** 109:26-37.
150. Yang, J., X. Song, M. Cao, X. Deng, W. Zhang, X. Yang, and N.G. Swenson. 2021. On the modeling of tropical tree growth: the importance of intra-specific trait variation, non-linear functions and phenotypic integration. **Annals of Botany** 127:533-542.
149. Schwartz, N.B., X. Feng, R. Muscarella, N.G. Swenson, M.N. Umana, J.K. Zimmerman, and M. Uriarte. 2020. Topography and traits modulate tree performance and drought response in a tropical forest. **Frontiers in Forests and Global Change** 3:596256.
148. Iida, Y. and N.G. Swenson. 2020. Towards linking species traits to demography and assembly in diverse tree communities: revisiting the importance of size and allocation. **Ecological Research** 35:947-966.
147. Zhang, J., N.G. Swenson, J. Liu, M. Liu, X. Qiao, and M. Jiang. 2020. A phylogenetic- and trait-based analysis of community assembly in a subtropical forest in central China. **Ecology and Evolution** 10:8091-8104.
146. Zambrano, J., N.G. Beckman, P. Marchand, J. Thompson, M. Uriarte, J.K. Zimmerman, M.N. Umana, and N.G. Swenson. 2020. The scale dependency of trait-based tree neighborhood models. **Journal of Vegetation Science** 31:581-593.

145. Worthy, S.J., D.C. Laughlin, J. Zambrano, M.N. Umana, C. Zhang, L. Lin, M. Cao, and N.G. Swenson. 2020. Alternative designs and tropical tree seedling growth performance landscapes. **Ecology** 101:e03007.
144. Banares-de-Dios, G., M.J. Macia, I. Granzow-de la Cerda, I. Arnelas, G.M. de Carvalho, C.I. Espinosa, N. Salinas, N.G. Swenson, and L. Cayuela. 2020. Linking patterns and processes of tree community assembly across spatial scales in tropical montane forests. **Ecology** 101:e03058.
143. Swenson, N.G., C.M. Hulshof, M. Katabuchi and B.J. Enquist. 2020. Long-term shifts in the functional composition and diversity of a tropical dry forest: a 30-year study. **Ecological Monographs** 90:e01408.
142. Kattge, J., ...N.G. Swenson,... and I. Zo-Bi (517 Authors Total). 2020. TRY plant trait database - Enhanced coverage and open access. **Global Change Biology** 26:119-188.
141. Mao, L, N.G. Swenson, X. Sui, J. Zhang, S. Chen, J. Li, P. Peng, G. Zhou, and X. Zhang. 2020. The geographic and climatic distribution of plant height diversity for 19,000 Angiosperms in China. **Biodiversity and Conservation** 29:487-502.
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White Papers

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Seminars

- EvolTree Biannual Conference, Brasov, Romania, September 2024, Keynote Speaker (Host: Hilke Schroder)
 Title: *Functional genomics as a window into the drivers of community structure and dynamics in temperate and tropical forests.*
- Department of Biological Sciences, Marquette University, Milwaukee, WI., March 20223, (Host: Stefan Schnitzer)
 Title: *Biogeographic context is linked to tree gene expression, local scale co-occurrence and demographic rates in a Wisconsin forest.*
- Department of Botany, Smithsonian Institution, Washington, D.C., July 2019, (Host: Liz Zimmer)
 Title: *Investigating tree community structure and dynamics: from phylogenies and traits to transcriptomes.*
- Department of Biology, University of Alabama, Tuscaloosa, Alabama, August 2018, (Host: Carla Atkinson)
 Title: *Functional diversity and tree community dynamics.*
- Biodiversity Research Seminar Series, University of British Columbia, Kelowna, British Columbia, March 2018, (Host: Jason Pither)
 Title: *Investigating tree community structure and dynamics: from phylogenies and traits to transcriptomes.*
- Center for Tree Science, Morton Arboretum, Lisle, Illinois, March 2018, (Host: Andrew Hipp)
 Title: *The structure and dynamics of tree assemblages – from traits and phylogenies to transcriptomes and functional phylogenomics.*
- EvolTree Physiological and Molecular Adaptation to Climate Change in Forest Trees Workshop, Volcani Center and Weizmann Institute of Science, Tel Aviv, Israel, March 2018, Key Note Speaker, (Host: Rakefet David-Swartz)
 Title: *Tree transcriptomic response to drought, co-occurrence and phylogenetic signal.*

- Forestry and Forest Products Research Institute, Tsukuba, Japan, February 2017, (Hosts: Hiroko Kurokawa and Yoshiko Iida)
 Title: *Transcriptomic analyses of tree communities: moving beyond functional traits and phylogenetic relatedness.*
- Smithsonian Environmental Research Center, Edgewater, Maryland, October 2016, (Host: Sean McMahon)
 Title: *Transcriptomic analyses of tree communities: moving beyond functional traits and phylogenetic relatedness.*
- Department of Biology, Universidad de Puerto Rico, Rio Piedras, Puerto Rico, April 2016, (Host: Miguel Acevedo)
 Title: *Transcriptomic analyses of tree communities: moving beyond functional traits and phylogenetic relatedness.*
- Center for Genome Research and Biocomputing, Oregon State University, Corvallis, Oregon, February 2016, (Host: Andy Jones)
 Title: *Transcriptomic analyses of tree communities: moving beyond functional traits and phylogenetic relatedness.*
- Linnean Centre for Plant Biology, Uppsala, Sweden, August 2015, (Host: Hakan Rydin)
 Title: *The phylogenetic and functional imprint on community structure: enhancing the species-centric approach.*
- Ecological Society of America Annual Meeting, Baltimore, Maryland, August 2015.
 Title: *The phylogenetic distribution of functional diversity across a worldwide forest dynamics plot network.*
- Ecological Society of Japan Annual Meeting, Hiroshima, Japan, March 2014.
 Title: *The functional diversity of temperate and tropical tree communities and how it relates to their structure and dynamics through space and time.*
- Department of Biology, Grand Valley State University, Allendale, Michigan, February 2014, (Host: Gary Greer)
 Title: *The evolutionary and functional fingerprint on woody plant community assembly.*
- Department of Ecology and Evolutionary Biology, University of Michigan, Ann Arbor, Michigan, February 2014, (Host: Chris Dick)
 Title: *The evolutionary and functional fingerprint on woody plant community assembly.*
- 21st-Century Naturalists: Integrating Pattern and Process to Understand Biodiversity - A Conference of the American Society of Naturalists, Asilomar, California, January 2014.
 Title: *The idiosyncratic evolutionary imprint on assembly in New Zealand woody plant communities.*
- Department of Plant Biology, Michigan State University, East Lansing, Michigan, November 2013 (Host: Richard Triemer)
 Title: *The distribution and diversity of woody plant function across scales.*
- Forest Biodiversity-Ecosystem Function Symposium, Chinese Academy of Science, Gutianshan, China, Keynote Speaker, October 2013, (Host: Keping Ma & Bernhard Schmid)
 Title: *The imprint of phylogenetic history on community assembly and its implications for ecosystem function.*
- Biology Department, Hope College, Holland, Michigan, October 2013, (Host: Jianhua Li)
 Title: *The evolutionary and functional fingerprint on woody plant community assembly.*
- Department of Biosciences, Aarhus University, Aarhus, Denmark, September 2013, (Host: Jens-Christian Svenning)
 Title: *The distribution, diversity and structure of function in temperate and tropical*

tree assemblages

- INTECOL/British Ecological Society Annual Meeting, London, England, August 2013.
Title: *Mapping the distribution and diversity of plant height on continental scales using large trait and spatial datasets.*
- Association for Tropical Biology and Conservation Annual Meeting, San Jose, Costa Rica, June 2013.
Title: *Exploring the phylogenetic distribution of tree functional diversity: a comparative study of temperate and tropical forest plots enabled by a DNA barcode mega-phylogeny.*
- Department of Biology, Organismal Biology Day Plenary Speaker, University of Maryland, April 2013, (Hosts: Biology Graduate Students & Charlie Fenster)
Title: *Integrating traits and phylogenetics into the study of community assembly and dynamics.*
- Department of Biological Sciences, Western Michigan University, October 2012, (Host: Todd Barkman)
Title: *Phylogenetic and functional investigations of tree community assembly.*
- Global Biodiversity Information Facility, Science Symposium Key Note Lecture & Ebbe Nielsen Prize Lecture, Lillehammer, Norway, September 2012, (Host: Dr. Leonard Krishtalka)
Title: *The distribution and diversity of woody plant function on continental scales.*
- Department of Ecology and Evolutionary Biology, Yale University, March 2012, (Host: Suzanne Alonzo)
Title: *Functional and phylogenetic perspectives on the structure, dynamics and diversity of species assemblages.*
- Department of Biology, University of Massachusetts - Boston, February 2012, (Host: Liam Revell)
Title: *A functional perspective on tree community assembly and dynamics.*
- Department of Natural Resources and Environmental Studies, National Dong Hwa University, Taiwan, December 2011, (Hosts: Yu-Yun Chen and I-Fang Sun)
Title: *The distribution and dynamics of phylogenetic and functional diversity in tropical tree communities.*
- Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, China, November 2011, (Host: Min Cao)
Title: *The distribution and dynamics of phylogenetic and functional diversity in tropical tree communities.*
- Jepson Herbarium, University of California – Berkeley, October 2011, (Host: Rosemary Gillespie)
Title: *The distribution and diversity of woody plant function from local to continental scales.*
- Curriculum for the Environment and Ecology, University of North Carolina, September 2011, (Hosts: CEE Graduate Students)
Title: *The utility of phylogenetic and functional axes of biodiversity in understanding the assembly and dynamics of communities.*
- Ecological Society of American Annual Meeting, Austin, Texas, August 2011.
Title: *Comparative phylogenetic and functional turnover among temperate versus tropical forest sites.*
- Ecological Society of American Annual Meeting, Austin, Texas, August 2011.
Title: *Distribution of functional traits in the trees of Europe and eastern North America.*
- CTFS – CforBio Symposium on Climate Change and Forest Biodiversity Conservation, Institute of Botany, Chinese Academy of Sciences, Beijing, China, July 2011

- (Hosts: Stuart Davies and Keping Ma)
 Title: *Phylogenetic and functional alpha and beta diversity in tropical and temperate CTFs plots.*
- Young Investigators Prize Symposium, Annual Meeting of the American Society of Naturalists, June 2011 (Host: Bob Ricklefs)
 Title: *The distribution and diversity of plant function from local to continental scales.*
- Phylogenetic Ecology Symposium, National Center for Ecological Analysis and Synthesis, November 2010 (Hosts: Jeannine Cavender-Bares, David Ackerly and Ken Kozak)
 Title: *The latitudinal gradient in phylogenetic and functional beta diversity in tree communities*
- Institute of Botany, Chinese Academy of Sciences, Beijing, August 2010, (Hosts: Keping Ma and Xiangcheng Mi)
 Title: *The distribution of phylogenetic and functional diversity through space and time in tropical tree communities*
- Association of Tropical Biology and Conservation Annual Meeting, Bali, Indonesia, July 2010.
 Title: *Phylogenetic beta diversity in tropical forest plots: an examination of alternative approaches.*
- Department of Forestry, Michigan State University, March 2010, (Host: Rich Kobe)
 Title: *Phylogenetic and functional turnover and diversity in tropical forests through space and time.*
- Ecological Society of American Annual Meeting, Albuquerque, New Mexico, August 2009.
 Title: *Phylogenetic turnover and diversity in tropical forests through space and time.*
- Association of Tropical Biology and Conservation Annual Meeting, Marburg, Germany July 2009.
 Title: *Phylogenetic turnover and diversity in tropical forests through space and time.*
- Early Career Scientists Symposium: Using Phylogenies in Ecology, University of Michigan, March 2009 (Host: Deborah Goldberg).
 Title: *Stochastic and deterministic temporal turnover of the tree composition in a tropical rain forest: the role of phylogeny and species function.*
- Kellogg Biological Station, Michigan State University, October 2008.
 Title: *The Ecological Implications and Evolution of Whole Plant Form and Function.*
- Ecological Society of America Annual Meeting, Milwaukee, Wisconsin, August 2008.
 Title: *Long-Term Trends in the Species, Functional, and Phylogenetic Diversity in Two Neo-Tropical Forest Dynamics Plots.*
- Organization for Tropical Studies Tropical Plant Systematics Course, Parque Nacional Palo Verde, Costa Rica, June 2008 (Hosts: Brad Boyle and Robbin Moran)
 Title: *Phylogeny, Functional Traits, Communities and the Comparative Method.*
- Department of Ecology and Evolutionary Biology, May 2008. (Dissertation Defense)
 Title: *The Influence of Phylogenetic and Functional Similarity on Species Coexistence Through Space and Time.*
- Plant Biology Department, Michigan State University, February 2008. (Host: Doug Schemske) Title: *Functional Convergence and Divergence in Plant*

Communities Through Space and Time.

- Department of Ecology and Evolutionary Biology, University of Arizona, October 2007.
Title: *Functional Convergence, Divergence and Co-Existence in a Neo-Tropical Dry Forest.*
- Center for Tropical Forest Science, Smithsonian Tropical Research Institute, Panama City, Panama, September 2007. (Host: Stuart Davies) Title: *Phylogenetic and Functional Diversity in Tropical Forest Plot Communities.*
- Ecological Society of America Annual Meeting, San Jose, California, August 2007. Title: *The Distribution and Diversity of Plant Function Across the New World.*
- El Verde Field Station, Institute for Tropical Ecosystem Studies, University of Puerto Rico, March 2007 (Host: Jill Thompson). Title: *Phylogenetic and Functional Diversity in Tropical Forest Plot Communities.*
- Laboratory of Tree-Ring Research, University of Arizona, March 2007 (Host: Troy Knight). Title: *Ecological and Evolutionary Determinants of a Key Plant Functional Trait: Wood Density and its Community-Wide Variation Across Latitude and Elevation.*
- Department of Ecology and Evolutionary Biology, University of Arizona, March 2007.
Title: *A Phylogenetic and Functional Assessment of Plant Assemblages Across Broad Gradients.*
- Department of Ecology and Evolutionary Biology, University of Arizona, April 2006. Title: *The Geographic Distribution and Evolutionary History of Wood Density.*
- Ecological Society of America Annual Meeting, Montreal, Quebec, August 2005. Title: *Phylogenetic Patterning and Spatial Scaling in Tropical Forest Plot Communities.*
- Southwestern Association of Biologists Annual Meeting, Portal, Arizona, October 2004.
Title: *Hotspots of Contact Zone Clustering.*
- Department of Ecology and Evolutionary Biology, University of Arizona, October 2004.
Title: *Do Suture Zones Exist?*
- Department of Biology, New Mexico State University, June 2004 (Thesis Defense). Title: *The Geography and Physiology of Hybridization, Hybrid Zones, and Species Range Boundaries.*
- Department of Geography, New Mexico State University, October 2003 (Host: Dr. Mike DeMers). Title: *Testing Macro-Evolutionary Theories with GIS.*

Service & Outreach

- Associate Editor: Ecology Letters, 2015 – Present.
- Associate Editor: Journal of Ecology, 2012 – 2020.
- Specialty Chief Editor: Functional Plant Biology, Frontiers in Plant Science, 2017 – 2019.
- Associate Editor: Global Ecology and Biogeography, 2015 – 2018.
- Subject Editor: Ecography, 2011 – 2018.
- Editorial Board: PLoS One, 2011 – 2013.
- Peer Reviewer For: *American Journal of Botany, American Naturalist, Annals of Botany, Austral Ecology, Basic and Applied Ecology, Biogeosciences, Biological Conservation, Biotropica, Ecography, Ecological Entomology, Ecological Monographs, Ecology, Ecology Letters, Ecotropica, Evolution, Evolutionary Ecology, Evolutionary Ecology Research, Forest Ecology and Management, Functional Ecology, Functional Plant Biology, Global Ecology and Biogeography, Heredity, International Journal of Plant Sciences, Journal of Animal Ecology, Journal of Biogeography, Journal of Ecology, Journal of Evolutionary Biology,*

Journal of Heredity, Journal of Plant Ecology, Journal of Tropical Ecology, Journal of Vegetation Science, Methods in Ecology and Evolution, Molecular Ecology, Nature, Nature Communications, Nature Ecology and Evolution, New Phytologist, New Zealand Journal of Botany, Oecologia, Oikos, PLoS One, Plant Ecology and Diversity, Plant Science, Proceedings of the National Academy of Sciences U.S.A., Proceedings of the Royal Society of London Series B, Science, Science Advances, Systematic Biology, Theoretical Ecology, Trends in Ecology and Evolution, Trends in Plant Science. (reviewer for about 10-20 articles per year)

Book Reviewer For: *Springer-Verlag, Oxford University Press, University of Chicago Press*

Grant Panelist: *NSF Doctoral Dissertation Improvement Grants; NSF Graduate Research Fellowship Program, NSF Population and Community Ecology, NSF Ecosystem Science, NSF Macrosystems Biology, NSF Dimensions of Biodiversity*

Grant Reviewer For: *Academy of Science of the Czech Republic, Austrian Science Fund, Australian Research Council, Fonds de la Recherche Scientifique (FNRS: France), U.S. Department of Defense - SERDP, U.S. National Science Foundation, Netherlands Organisation for Scientific Research, Superior Council of the National Fund for Scientific and Technological Development – FONDECYT – Chilean Government Funding Body.*

Co-Editor, 2017, Special Feature in *Journal of Ecology*, “*Community transcriptomics, genomics and the problem of co-occurrence*”.

Co-Organizer, 2013, International Biogeography Society Meeting
Symposium: *Beyond Bergmann: New Perspectives on the Biogeography of Traits*, Miami, U.S.A.

Instructor and Organizer, 2017, SESYNC
Analytical Workshop, *Phylogenetic and Functional Analyses in Ecology*, Annapolis, Maryland.

Instructor and Organizer, 2017, Universidad Rey Juan Carlos
Analytical Workshop, *Phylogenetic and Functional Analyses in Ecology*, Madrid, Spain.

Instructor, 2013, Department of Biology, University of Maryland
Analytical Workshop, *Phylogenetic and Functional Analyses of Communities and Geographic Distributions*

Instructor and Organizer, 2012, National Dong Hwa University
Analytical Workshop, *Phylogenetic and Functional Analyses in Ecology*, Hualien, Taiwan.

Instructor and Organizer, 2010, Chinese Academy of Sciences – Institute of Botany
Analytical Workshop, *Using Phylogenetic Trees to Analyze Communities, Traits and Ranges*, Beijing, China.

Co-Organizer, 2010, Association for Tropical Biology and Conservation Annual Meeting
Symposium: *Phylogenetics in the tropics: building trees to understand community structure and tropical biodiversity*, Bali, Indonesia. Co-Organizers W. John Kress and Vinita Gowda.

Co-Organizer, 2004, Graduate Research and Arts Symposium, New Mexico State University.

Organization for Tropical Studies Representative, 2012 – Present, Michigan State University.
Seminar Committee Member, 2011 - 2015, Department of Plant Biology, Michigan State University

Graduate Committee Member, 2012 - 2015, Department of Plant Biology, Michigan State University

Faculty Search Committee Member, 2012-2013, 2013-2014, Department of Plant Biology, Michigan State University

Secretary and Publicist, 2003-2004, Graduate Student Council, New Mexico State University.

Vice President, 2003-2004, Biology Graduate Student Organization, New Mexico State University.

Judge, 2003, Annual Biology Symposium, New Mexico State University.

Teaching

Instructor, Practicum in Field Environmental Biology: Track 2, 2021 - Present, University of Notre Dame

Instructor, Practicum in Field Environmental Biology: Track 1, 2021 - Present, University of Notre Dame

Instructor, Introduction to UNDERC, 2021 - Present, University of Notre Dame

Instructor, Plant, Society and the Environment, 2021 - Present, University of Notre Dame

Instructor, Ecology and Evolution of Plant Function, 2019, University of Maryland

Instructor, Principles of Ecology, 2016 – 2021, University of Maryland.

Instructor, R programming for Ecology and Evolution, 2017, University of Maryland

Instructor, Grant Writing in Ecology and Evolution, 2016, University of Maryland

Instructor, Plant Ecology, 2015, 2018, University of Maryland.

Instructor, Tropical Biology, 2013, Michigan State University.

Instructor, Introductory Biology, 2012, 2014, Michigan State University.

Instructor, Plant Structure and Function Lecture and Lab, 2011, 2013, 2015, Michigan State University.

Guest Faculty, Tropical Plant Systematics – Phylogenetic Analyses of Traits and Communities, 2008, Organization for Tropical Studies.

Teaching Associate, Plant Form, Function and Diversity, 2007-2008, University of Arizona, Instructor: Dr. Brian Enquist

Head Teaching Associate, Ecology, 2006-2008, University of Arizona, Instructor: Dr. Michael Rosenzweig

Teaching Associate, Vertebrate Physiology, 2004, University of Arizona, Instructor: Dr. Kevin Bonine

Teaching Assistant, Human Anatomy and Physiology, 2002, New Mexico State University, Instructor: Dr. Peter Houde