

## Scott A. Mangan

Arkansas State University  
Department of Biological Sciences  
Email: smangan@astate.edu  
Phone (cell): 314-265-9042

### RESEARCH INTERESTS

Identifying the mechanisms that lead to the organization and function of biological communities is a fundamental goal in ecology. Many of the major theories in plant ecology have centered on competitive interactions. However, plants are associated with a wide variety of microbes that directly influence their fitness. One of the major goals of my research program is to re-evaluate classic theories in plant ecology within the context of microbial interactions. Through direct experimentation, we find that plant-microbial interactions are fundamental determinants of plant species coexistence, relative abundance, and ecosystem functioning in both tropical and temperate plant communities.

### EDUCATION

Indiana University, Bloomington  
University of Wisconsin – Oshkosh  
University of Wisconsin – Oshkosh

Ph. D. in Biology, 2006  
M.S. in Biology, 1999  
B.S in Biology, 1996

### PROFESSIONAL APPOINTMENTS

Arkansas State University  
Washington University in St. Louis  
University of Wisconsin – Milwaukee  
Smithsonian Tropical Research Institute

Associate Professor  
Assistant Professor  
Post-Doctoral Associate  
Post-Doctoral Fellow

August 2020 - Present  
Sept. 2012 – June 2020  
Jan. 2008 – July 2012  
Jan. 2007 – Dec. 2007

### RESEARCH GRANTS

8. Tyson Interdisciplinary Faculty Seed Grant. Long-term effects of drought and plant diversity on soil nutrients and microbial communities. PI: S. Mangan, Co-PI: J. Catalano, Co-PI: C. Edwards. August 2018 – July 2020. Total awarded \$20,000 to Mangan's lab.
7. Living Earth Collaborative. Conserving rare plant species through ecological restoration in Missouri woodlands. PI: J. Leighton Reid, Co-PIs: S. Mangan, C. Stein, M. Albrecht, Q. Long. June 1, 2018 – May 31, 2020, Total awarded: \$30,000; \$8000 awarded to Mangan's lab.
6. National Science Foundation, Division of Environmental Biology. DEB-1457561  
*COLLABORATIVE RESEARCH*: Genetic diversity, resistance genes, and negative density dependence in tropical tree seedling dynamics. Lead University PI: L. Comita (Yale), Collaborative university PIs: **S. Mangan** (Wash. U.), J. Marden, C. dePamphilis (Penn. State U.). July 1, 2015 – June 1, 2019 (no cost extension), Total awarded: \$841,559.

5. National Science Foundation, Division of Environmental Biology. *COLLABORATIVE RESEARCH: Pathogen-mediated negative feedbacks determine tropical tree species abundance*. DEB-1257989. Lead university PI: **S. Mangan** (Wash. U.), Collaborative university PIs: R. Gallery (U. Arizona), S. Schnitzer, C-H Yang (UW-Milwaukee). June 1, 2013 – June 1, 2018. Total awarded: \$754,000, \$373,312 awarded to Mangan's Lab.
4. International Center for Energy, Environment and Sustainability. Does climate change affect the relative importance between belowground and aboveground enemies to plant coexistence? PI: **Scott Mangan**, Co-PIs: Rachel Pencykowski & C. Stein. June 1, 2017 – May 31, 2018, \$30,000 awarded to Mangan's lab.
3. International Center for Energy, Environment and Sustainability. Quantifying diverse ecosystems to suggest agriculture responses to climate change. PI: R. Pless. Co-PIs: **S. A. Mangan**, S. Blake, R. Arndt. May 1, 2015 – May 30, 2017. Total Awarded: \$42,000, \$8000 awarded to Mangan's Lab.
2. International Center for Energy, Environment and Sustainability. Biodiversity-ecosystem functioning under climate change: the role of phylogenetic diversity and soil microbes. PI: **S. A. Mangan**. Co-PIs: C. Stein, D. A. Fike, M. Tobin. May 1, 2014 – September 30, 2015. \$40,000 Awarded to Mangan Lab: \$40,000.
1. National Geographic. Tracking Bison and the ecological restoration of one of the last unploughed deep soil tallgrass prairies. # 9385-13. PI: S. Blake. Co-PIs: R. S. Arndt, J. P. Gibbs, D. Ladd, **S. A. Mangan**.

*Grants awarded to Mangan Lab undergraduate students*

4. BioSURF. Disentangling the effects of mutualistic and antagonistic soil microbes on Missouri native prairie species. 2018. Luiza Alves.
3. Environmental Studies Program. The enemy of an enemy is a friend: effects of *Phythium oligandrum* on belowground plant-pathogen interactions. 2017. Hanusia Higgins.
2. International Center for Energy, Environment and Sustainability. Drivers of plant fecundity in tallgrass prairies: Direct and indirect effects of plant diversity and soil microbes on plant-pollinator interactions. 2017. Savannah Fuqua.
1. Environmental Studies Program. Importance of soil microbes to carbon sequestration dynamics in tallgrass prairies under changing precipitation regimes. 2016. George Zhou.

*External Grants & Fellowships (previous to Washington University appointment)*

12. UWM Research Foundation, Postdoctoral Research Fellowship, \$7500, 2010
11. Smithsonian Tropical Research Institute, Postdoctoral fellowship. \$37,000, 2007
10. IU College of Letters and Sciences Dissertation Fellowship. \$15,000, 2006
9. Floyd Dissertation Year Fellowship. \$8500, 2005
8. Floyd Fellowship, IU Summer Research Support, 2005
7. National Science Foundation, Doctoral Dissertation Improvement Grant. \$12,000, 2003
6. Smithsonian Tropical Research Institute Soil Initiative Grant \$4275, 2003
5. Smithsonian Tropical Research Institute, Predoctoral Fellowship. \$20,000, 2002
4. American Society of Mammalogists, Grants-in-Aid. \$2500, 2002

3.

3. Sigma Xi Research grant. \$600, 2001
2. Smithsonian Tropical Research Institute, STRI Short-term Fellowship. \$2300, 1999
1. Zoological Society of Milwaukee County, Graduate Research Grant. \$2000, 1998

## MANUSCRIPTS IN REVIEW

45. Becknell, R. E., K. G. Showalter, M. A. Albrecht, and S. A. Mangan. Positive soil mutualisms potentially determine the reintroduction outcomes of an endangered legume (**Restoration Ecology**, editor invited revision).

## PEER-REVIEWED PUBLICATIONS

44. Stein, C. and **S. A. Mangan**. 2020. Soil microbes increase the likelihood for coexistence among competing plant species. **Ecology**, *In press*. doi:10.1002/ecy.3147.
43. LaManna, J. A., **S. A. Mangan**, and J. A. Myers. 2020. Conspecific negative density dependence and why its study should not be abandoned. **Ecosphere**, *In press*.
42. Stump, S. M., J. H. Marden, N. Beckman, **S. A. Mangan**, and L. A. Comita. 2020. Susceptibility to specialist natural enemies may be both the cause and consequence of rarity. **The American Naturalist**. *In press*.
41. Adu-Oppong, B., **S. A. Mangan**, C. Stein, C. P. Catano, J. A. Meyers, and G. Dantas. 2020. Co-existing prairie plants host distinct root endophytic bacterial communities assembled by deterministic process. **Plos One** 15(6): e0234537. doi.org/10.1371/journal.pone.0234537.
40. Schmidt, R., H. Auge, H. B. Deising, I Hensen, **S. A. Mangan**, M. Schadler, C. Stein, and T. M. Knight. 2020. Host abundance but not origin and phylogenetic structure explain pathogen infection in grassland communities. **Ecology and Evolution** 10: 5506-5516. doi.org/10.1002/ece2.692.
39. Schroeder, J., A. Dobson, **S. A. Mangan**, and E. A. Herre. 2020. Mutualist and pathogen traits interact to affect plant community structure in a spatially explicit model. **Nature Communications** 11: 1-10. DOI/10.1038/s41467-020-16047-5.
38. Pizano, M. C., J. H. Graham, K. Kitajima, and **S. A. Mangan**. 2019. Negative feedback dominates forest fragments and agricultural lands in the tropical Andes. **Ecology**. DOI.org/:10.1002/ecy.2850.
37. Liang, A., C. Stein, E. Pearson, J. A. Myers, R. Crandall, **S. A. Mangan**. 2019. Snail herbivory affects seedling establishment in a temperate forest in the Ozarks. **Journal of Ecology**. DOI.org/10.1111/1365-2745.13150.
36. Crawford, K. M., J. T. Bauer, L. S. Comita, M. B. Eppinga, D. J. Johnson, **S. A. Mangan**, S. A. Queenborough, A. E. Strand, K. N. Suding, J. Umbanhowar, and J. D. Bever. 2019. When and where plant-soil feedback may promote plant coexistence: a meta-analysis. **Ecology Letters**. 22: 1274-1284. https://doi.org/10.1111/ele.13278.
35. Eck, J. L., S. M. Stump, C. S. Delavaux, **S. A. Mangan**, and L. S. Comita. 2019. Evidence of

- within-species specialization by soil microbes and the implications for plant community diversity. *Proceedings of the National Academy of Science* 116: 7371- 7376. DOI:10.1073/pnas.1810767116.
34. Spasojevic, M. J., K. Harline, C. Stein, **S. A. Mangan**, and J. A. Myers. 2019. Landscape context mediates the relationship between plant functional traits and decomposition. *Plant and Soil* 438: 377-391. ISSN:1573-5036.
  33. Sheldrake, M., N. P. Rosenstock, **S. A. Mangan**, D. Revillini, E. J. Sayer, P A. Olsson, E. V. J. Tanner, B. L. Turner, and S. J. Wright. 2018. Responses of arbuscular mycorrhizal fungi to long-term inorganic and organic nutrient addition in a lowland tropical forest. *The ISME Journal*. DOI/10.1038/s41396-018-0189-7
  32. J. A., LaManna, **S. A. Mangan**, et al., 2018. Response to comment (by Hulsmann and Hartig) on “Plant diversity increases with the strength of negative density dependence at the global scale”. *Science* 360: 1-4. DOI: 10.1126/science.aar3824.
  31. J. A., LaManna, **S. A. Mangan**, et al., 2018. Response to comment (by Chisholm and Fung) on “Plant diversity increases with the strength of negative density dependence at the global scale”. *Science* 360: 1-4. DOI: 10.1126/science.aar5245.
  30. Pizano, M. C., **S. A. Mangan**, J. H. Graham, and K. Kitajima. 2017. Host-specific effects of soil microbial filtrates prevail over those of arbuscular mycorrhizae in a fragmented landscape. *Ecological Applications* 29: 1946-1957: DOI/10.1002/eap.1579.
  29. J. A., LaManna, **S. A. Mangan**, A. Alonso, N. A. Bourg, W. Y. Brockelman, S. Bunyavejchewin, L. W. Chang, J. M. Chiang, G. B. Chuyong, K. Clay, R. Condit, S. Cordell, S. J. Davies, T. J. Furniss, C. P. Giardina, I. A. U. N. Gunatilleke, C. V. S. Gunatilleke, F. He, R. W. Howe, S. P. Hubbell, C. F. Hsieh, F. M. Inman-Narahari, D. Janík, D. J. Johnson, D. Kenfack, L. Korte, A. J. Larson, J. A. Lutz, S. M. McMahon, W. J. McShea, H. R. Memiaghe, A. Nathalang, V. Novotny, P. S. Ong, D. A. Orwig, R. Ostertag, G. G. Parker, R. P. Phillips, L. Sack, I. F. Sun, J. S. Tello, D. W. Thomas, B. L. Turner, D. M. Vela Díaz, T. Vrška, G. Weiblen, A. Wolf, S. Yap, and J. A. Myers. 2017. Plant diversity increases with the strength of negative density dependence. *Science* 356:1389-1392. DOI:10.1126/science.aam5678.
  28. Marden J. H, **S.A. Mangan**, M. Peterson, E. Wafula, H.W. Fescemyer, J. Der, C.W. dePamphilis, & L.S. Comita. 2017. Ecological genomics of tropical trees: how local population size and allelic diversity of resistance genes relate to immune responses, co-susceptibility to pathogens, and negative density dependence. *Molecular Ecology* 26: 2498-2513 DOI: 10.1111/mec.1399.
  27. Sheldrake, M., N. Rosenstock, D. Revillini, P. A. Olsson, **S. A. Mangan**, E. Sayer, W. Hakan, B. Turner, and E. Tanner. 2017. Arbuscular mycorrhizal fungal community composition is altered by long-term litter removal but not litter addition in a lowland tropical forest. *New Phytologist* 217: 455-467. DOI: 10.1111/nph.14384.
  26. Corrales, A., **S. A. Mangan**, Turner B., & Dalling J. W. 2016. An ectomycorrhizal nitrogen economy facilitates monodominance in a neotropical forest. *Ecology Letters* 19: 383-392. DOI: 10.1111/ele.12570
  25. Bever, J. D., **S. A. Mangan**, & H. Alexander. 2015. Maintenance of plant diversity by pathogens.

- Annual Review of Ecology, Evolution, and Systematics** 46: 305-325. doi.org/10.1146/annurev-ecolsys-112414-054306
24. Waring B. G., L. Á. Cansino, K. E. Barry, K. K. Becklund, S. Dale, M. G. Gei, O. R. Lopez, L. Markesteijn, **S. A. Mangan**, M. E. Rodriguez-Ronderos, R. M. Segnitz, & S. A. Schnitzer, and J. S. Powers. 2015. Pervasive and strong effects of plants on soil chemistry: a meta-analysis of individual plant 'Zinke' effects. *Proceedings of the Royal Society B* 282: DOI: 10.1098/rspb.2015.1001
  23. Wright A., M. Tobin, **S. A. Mangan**, & S. A. Schnitzer. 2015. Unique competitive effects of lianas and trees in a tropical forest understory. *Oecologia* 177: 561-569. doi.org/10.1007/s00444.
  22. Pizano, M. C., **S. A. Mangan**, J. H. Graham, and K. Kitajima. 2014. Habitat-specific positive and negative effects of soil biota on seedling growth in a fragmented tropical montane landscape. *Oikos* 123: 846-856. doi.org/10.1111/oik.01032
  21. Schnitzer, S. A., **S. A. Mangan**, and S. P. Hubbell. 2014. The Lianas of Barro Colorado Island, Panama. *In: The Ecology of Lianas*. Editors: S. A. Schnitzer, F. J. J. M. Bongers, & F. E. Putz. <https://doi.org/10.1002/9781118392409.ch7>
  20. Wright, A., S. A. Schnitzer, I. A. Dickie, A. R. Gunderson, G. A. Pinter, **S. A. Mangan**, and P. B. Reich. 2013. Complex facilitation and competition in a temperate grassland: loss of plant diversity and elevated CO<sub>2</sub> have divergent and opposite effects on oak establishment. *Oecologia* 171: 449-458. doi: 10.1007/s00442-012-2420-y
  19. Schnitzer, S. A., **S. A. Mangan**, J. W. Dalling, C. A. Baldeck, S. P. Hubbell, A. Ledo, H. Muller-Landau, M. F. Tobin, S. Aquilar, D. Brassfield, A. Hernandez, S. Lao, R. Perez, S. Rutishauser-York. 2012. Liana abundance, diversity, and distribution on Barro Colorado Island, Panama. *PloS ONE* 7: doi.org/10.1371/journal.pone.0052114
  18. Dalling, J. W., S. A. Schnitzer, C. Baldeck, K. Harms, R. John, **S. A. Mangan**, E. Lobo, and J. Yavitt. 2012. Resource-based habitat associations in a neotropical liana community. *Journal of Ecology* 100: 1174-1182. doi.org/10.1111/j.1365-2745.2012.01989.x
  17. Tobin, M. F., A. J. Wright, **S. A. Mangan**, and S. A. Schnitzer. 2012. Lianas have a greater competitive effect than trees of similar biomass on tropical canopy trees. *Ecosphere* 3: 1-11.
  16. Cayuela, L.... **S. A. Mangan** (37 out of 51 authors). 2012. The Tree Biodiversity Network (BIOTREE-NET): prospects for biodiversity research and conservation in the Neotropics. *Biodiversity & Ecology* 4: 211-224. 10.7809/b-e.00078
  15. Cayuela, L.... **S. A. Mangan** (37 out of 51 authors). 2012. La Red internacional de inventarios forestales (BIOTREE-NET) en Mesoamerica: avances, retos y perspectivas futuras. *Ecosistemas* 21: 126-135.
  14. Pizano, M. C., **S. A. Mangan**, E. A. Herre, A-H. Eom, and J. W. Dalling. 2011. Above- and belowground interactions drive habitat segregation between two cryptic species of tropical trees. *Ecology* 92, 47-56.

13. Schnitzer S. A., J. N. Klironomos, J. HilleRisLambers, L. L. Kinkel, P. B. Reich, K. Xiao, M. C. Rillig, B. A. Sikes, R. M. Callaway, **S. A. Mangan**, E. van Nes, and M. Scheffer. 2011. Soil microbes contribute to the classic plant diversity–productivity pattern. *Ecology* 92, 296-303.
12. Lambert, T. D., Halsey, M. K., Dittel, J. W., **Mangan, S. A.**, Delfosse, E., Adler, G. H., and Schnitzer, S. A. 2011. First record of Alston’s Woolly Opossum (*Micoureus alstoni*) from the canal area of Central Panama. *Mammalia* 75: 107-109.
11. **Mangan S. A.**, S. A. Schnitzer, E. A. Herre, K. M. L. Mack, M. C. Valencia, E. I. Sanchez, and J. D. Bever. 2010. Negative plant-soil feedbacks predict tree relative species abundance in a tropical forest. *Nature* 466: 752-755.
10. **Mangan, S. A.**, E. A. Herre and J. D. Bever. 2010. Specificity between Neotropical tree seedlings and their fungal mutualists leads to plant-soil feedback. *Ecology* 91: 2594-2603.
9. Herre, E. A., D. Kylo, **S. A. Mangan**, R. Husband, L. C. Mejia, A. H. Eom. 2006. An overview of arbuscular mycorrhizal fungi composition, distribution, and host effects from a tropical moist forest. In: Burslem D. F. R. P., M. A. Pinard, and S. E. Hartley (eds) Biotic interactions in the tropics.
8. **Mangan, S. A.**, A. H. Eom, G. H. Adler, J. B. Yavitt and E. A. Herre. 2004. Diversity of arbuscular mycorrhizal fungi across a fragmented forest in Panama: insular AMF spore communities differ from mainland communities. *Oecologia* 141: 687-700.
7. Pauw, A., S. A. Van Bael, H. A. Peters, S. D. Allison, J. L. C. Camargo, M. Cifuentes-Jara, A. Conserva, T. G. Restom, T. Heartsill-Scalley, **S. A. Mangan**, G. Nunez-Iturri, E. Rivera-Ocasio, M. Rountree, S. Vetter, C. Volkmer de Castilho. 2004. Physical damage in relation to carbon allocation strategies of tropical forest tree saplings. *Biotropica* 36: 410-413.
6. **Mangan, S. A.** and G. H. Adler. 2002 Seasonal dispersal of arbuscular mycorrhizal fungi by spiny rats in a Neotropical forest. *Oecologia* 131:587-597.
5. Adler, G. H., N. I. Suntsov, V. Suntsov, and **S. A. Mangan**. 2001. Fleas (Siphonaptera) collected from small mammals in southern Viet Nam in 1997-98. *Journal of Medical Entomology* 38: 210-213.
4. **Mangan, S. A.** and G. H. Adler. 2000. Consumption of arbuscular mycorrhizal fungi by terrestrial and arboreal small mammals in a Panamanian cloud forest. *Journal of Mammalogy* 81: 563-570.
3. **Mangan, S. A.** and G. H. Adler. 1999. Consumption of arbuscular mycorrhizal fungi by spiny rats (*Proechimys semispinosus*) in eight isolated populations. *Journal of Tropical Ecology* 15: 779-790.
2. Adler, G. H., **S. A. Mangan**, and V. Suntsov. 1999. Richness, abundance, and habitat relations of rodents in the Lang Bian Mountains of Southern Viet Nam. *Journal of Mammalogy* 80: 891-898.
1. Adler, G. H., **S. A. Mangan**, and T. D. Lambert. 1998. Reproductive phenology of *Cryosophila warszewiczii* in Central Panama. *Principes* 42: 185-189.

## COMPLETED MANUSCRIPTS

1. **Mangan, S. A.** and S. A. Schnitzer. Generalist effects of oomycetes suppress the strength of negative feedbacks in a tropical forest.
2. **Mangan S. A.** & J. D. Bever. Evolution of rodent dispersal in arbuscular mycorrhizal fungi leads to decreased benefit to their plant hosts.
3. Stein, C., M. Tobin, E. Valdez-Ward, N. Conejo, and **S. A. Mangan**. Soil microbes and water availability mediate the effects of phylogenetic and functional diversity on community productivity in an experimental tallgrass prairie.
4. Bever, J. D., Bauer, J., Comita, L., Suding, K., Eppinga, M., Crawford, K., and **S. A. Mangan**. Plant-soil feedback influence on plant population and communities: appropriate tests, measurements and interpretations.

## TEACHING

### Arkansas State University

Bio 4021: Biological Seminar  
Fall 2020 (26 students enrolled)

Bio 6001: Graduate Seminar  
Fall 2020 (8 students enrolled)

### Washington University

Biol 381: Introduction to Ecology  
Spring 2019 (60 students enrolled)  
Spring 2018 (58 students enrolled)

Biol 4193: Experimental Ecology Laboratory  
Spring 2019 (17 students enrolled)  
Spring 2018 (13 students enrolled)  
Spring 2017 (8 students enrolled)  
Spring 2016 (14 students enrolled)  
Spring 2015 (8 students enrolled)  
Spring 2014 (17 students enrolled)

Biol 580: Seminar in Ecology  
Spring 2016 (10 graduate students enrolled)

Biol 393: Practical Skills in Environmental Biology  
Spring 2015 (6 undergraduate students enrolled)

### Guest Lectures

Studio 602 "The One Tree Studio" (Fall 2017)

Biol 181 (Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2017)

Biol 381 (Spring 2013)

NSF IGERT Smithsonian Tropical Field Course (January 2013, January 2016, January 2017)

Teaching Workshops Attended

Fall 2018: "Inclusive Teaching and Learning: Fostering Civil Discourse in "Uncivil" Times"

Fall 2017: "Designing Transparent Assignments"

Spring 2017: "Designing a Course"

Spring 2017: "Designing Writing Assignments"

Spring 2016: "Providing Feedback to Help Students Improve Their Writing"

**MENTORING**

Postdoctoral Researcher:

1. Claudia Stein June 1, 2013 – August 2018

Current Graduate Students:

1. Rachel Becknell Summer 2016 – present

Completed graduate Students

1. Holly Bernardo Spring 2018

Washington University Graduate Students (rotation):

9. Philippa Tanforth Fall 2018  
8. Rhinannon Vargas Fall 2018  
7. Nicholas Fry Spring 2017  
6. Rachel Becknell Fall 2015  
5. Gretchen Walljasper Fall 2015  
4. Chris Catano Fall 2014  
3. Asa Earnest Spring 2014  
2. Kevin Stiles Fall 2013  
1. Bohemaa Adu-Oppong Fall 2013

Advisor for Washington University Undergraduate Thesis:

8. Kelli Showalter Spring 2019  
7. Savanna Fuqua Spring 2019  
6. Hanusia Higgins Spring 2018  
5. Molly Kuhs Spring 2017  
4. Karen Myers Spring 2017  
3. George Zhou Spring 2017  
2. Anna Lang Spring 2016  
1. Amelia Snyder Spring 2015

Technicians who worked in my lab at Washington University:

3. Taylor Rohan Summer 2015, Summer 2016  
2. Daniel Walton Summer 2015 – Fall 2015  
1. Eleanor Pearson June 2014 – June 2015



Technicians who worked in my lab in Panama (NSF funded):

|    |                     |                         |
|----|---------------------|-------------------------|
| 6. | Enith Rojas         | Fall 2014 – Fall 2018   |
| 5. | Maria Muriel Garcia | Fall 2014 – Fall 2018   |
| 4. | Mario Correa        | Spring 2016 – Fall 2017 |
| 3. | Massiel Barrios     | Spring 2016 – Fall 2018 |
| 2. | Lourdes Hernandez   | Spring 2016 – Fall 2017 |
| 1. | Blexein Contreras   | Spring 2016 – Fall 2018 |

Washington University undergraduates who did research in my lab:

|     |                   |                           |
|-----|-------------------|---------------------------|
| 23. | Jacob Longmeyer   | Summer 2018 – Spring 2019 |
| 22. | Kelli Showalter   | Spring 2018               |
| 21. | Luiza Alves       | Fall 2017 – Spring 2019   |
| 20. | Erin Carroll      | Summer 2017 – Spring 2018 |
| 19. | Savannah Fuqua    | Spring 2017 – Spring 2019 |
| 18. | Eddie Campell     | Spring 2017               |
| 17. | Molly Kuhs        | Spring 2015 – Spring 2017 |
| 16. | Karen Myers       | Spring 2015 – Spring 2017 |
| 15. | George Zhou       | Fall 2015 – Spring 2017   |
| 14. | Hanusia Higgins   | Fall 2015 – Fall 2018     |
| 13. | Cara Cook         | Summer 2016               |
| 12. | Anna Lang         | Summer 2013 – Spring 2016 |
| 11. | Jennifer Smith    | Spring 2016               |
| 10. | Jamal Gaddis      | Spring 2016               |
| 9.  | Ashley Knudson    | Fall 2015                 |
| 8.  | Lawrence Little   | Summer 2015 – Fall 2015   |
| 7.  | Amelia Snyder     | Summer 2014 – Summer 2015 |
| 6.  | Alison Palmer     | Spring 2015               |
| 5.  | Aiza Busto        | Summer 2015               |
| 4.  | Emily Goering     | Fall 2014                 |
| 3.  | Eleanor Pearson   | Fall 2013 – Spring 2014   |
| 2.  | Grant Shillington | Spring 2014               |
| 1.  | Nathaniel Thomas  | Fall 2013                 |

Washington University Undergraduate Research Opportunities in Panama (NSF funded):

|    |                 |             |
|----|-----------------|-------------|
| 6. | Savanna Fuqua   | Spring 2018 |
| 5. | Erin Carroll    | Spring 2018 |
| 4. | Hanusia Higgins | Summer 2016 |
| 3. | Abbie Harville  | Summer 2016 |
| 2. | Ashley Knudson  | Summer 2015 |
| 1. | Karen Myers     | Summer 2015 |

Panamanian undergraduates who did research in my lab in Panama:

|    |                   |                         |
|----|-------------------|-------------------------|
| 4. | Iliana Qunitero   | Spring 2015 – Fall 2016 |
| 3. | Yussef Castillo   | Fall 2015 – Fall 2016   |
| 2. | Elkjeear Gonzalez | Spring 2015 - Fall 2015 |
| 1. | Guadalupe Corro   | Fall 2015               |

Visiting undergraduates who did research in my lab:

|    |                |             |
|----|----------------|-------------|
| 7. | Sarah Stockman | Summer 2017 |
|----|----------------|-------------|

- |    |               |                   |
|----|---------------|-------------------|
| 6. | Aspen Workman | Summer 2017       |
| 5. | Nancy Conejo  | Summer 2016       |
| 4. | Junhwi Yoo    | Summer 2016       |
| 3. | Evelyn Valdez | Summer 2014, 2015 |
| 2. | Corrine Amir  | Summer 2014       |
| 1. | Max Herzog    | Summer 2013       |

High School Teachers who did research in my lab:

- |    |              |             |
|----|--------------|-------------|
| 1. | Timothy Reed | Summer 2015 |
|----|--------------|-------------|

High school students who did research in my lab:

- |     |                  |   |
|-----|------------------|---|
| 16. | Anna Grimenstein | Summer 2017   |
| 15. | Nicole Wang      | Summer 2017   |
| 14. | Owen Kathriner   | Summer 2017   |
| 13. | Genesis Dancer   | Summer 2017   |
| 12. | Athena Oakes     | Summer 2016   |
| 11. | Melissa Gastelum | Summer 2016   |
| 10. | Lara Tapy        | Summer 2016   |
| 9.  | McKenzie Ruff    | Summer 2016   |
| 8.  | Bailee Warsing   | Summer 2014, Fall 2014, Summer 2015,<br>Spring 2016 |
| 7.  | Teraya Marble    | Spring 2015 – Spring 2016                           |
| 6.  | Jordy Tellez     | Spring 2015 – Spring 2016                           |
| 5.  | Noc Nguyen       | Spring 2015 – Spring 2016                           |
| 4.  | Megan Kerr       | Summer 2015   |
| 3.  | Jerita Larry     | Summer 2015   |
| 2.  | Ben Difani       | Summer 2014   |
| 1.  | Aiza Bustos      | Summer 2014   |

Visiting Graduate Students:

- |    |                      |                   |
|----|----------------------|-------------------|
| 2. | Miguel Angel Redondo | Summer 2017       |
| 1. | Robin Schmidt        | Summer 2014, 2015 |

Students (Prior to Wash. U. Appointment):

- |    |   |
|----|---|
| 8. | Daniel Revillini (Master student from the USA)        |
| 7. | Merlin Sheldrake (Ph. D. student from the U.K.)       |
| 6. | Camila Pizano (undergraduate from Colombia)           |
| 5. | Mariana Valenica (undergraduate from Panama)          |
| 4. | Paulien Gankema (Master student from the Netherlands) |
| 3. | Carlos Aguilar (undergraduate from El Salvador)       |
| 2. | Femke Maes (undergraduate from the Netherlands)       |
| 1. | Alexandra Schmitz (undergraduate from the USA)        |

**SERVICE**

Proposal Review Panel

- |    |   |      |
|----|---|------|
| 3. | National Science Foundation. Division of Environmental Biology. | 2017 |
| 2. | US Department of Energy. Critical Ecosystems -Tropical Panel.   | 2016 |

1. National Science Foundation. Division of Environmental Biology. 2015

Working Group

1. NIMBioS. Theory of Plant-Soil Feedback: Phenomenological, Mechanistic, and Spatial Models. Organizers: J.D. Bever & M.B. Eppinga 2013-2015

University-wide Committees:

3. Wash. U. Climate Change Steering Committee (Fall 2017 – 2019)
2. Tyson Research Center Steering Committee (Fall 2014 – 2019)
1. Tyson Directorship Search Committee (Fall 2013 – Spring 2014)

College of Arts and Science Committees:

2. Organization for Tropical Studies Wash. U. Liaison (Fall 2014 – 2019)
1. Environmental Studies Steering Committee (Fall 2014 – 2019)

Departmental Committees:

10. Environmental Biology Major Steering Committee – Chair (Fall 2015 – 2019)
9. Ecology faculty search committee (Fall 2014 - Spring 2015)
8. Greenhouse Steering Committee (Fall 2014 – 2019)
7. Evolutionary Biologist faculty search committee (Fall 2013 – Spring 2014)
6. EEPB Curriculum Review subcommittee (Fall 2013)
5. EEPB Qualifying Exam committee (Spring 2013, 2015, 2016)
4. Harrison Stalker Prize committee (Spring 2013, 2014, 2015, 2016, 2017)
3. Spector Prize thesis reviewer (Spring 2013)
2. EEPB graduate program steering committee (2012 – 2019)
1. EEPB graduate admissions committee (2012 – 2019)

Participant of the following Washington University sponsored events:

3. Tyson Undergraduate Summer Research Mentor (Summers 2013 through 2019)
2. Mentor Connections (Wash. U. Office of Undergraduate Research)
1. The Tyson Seminar (I-CARES)

Graduate Thesis Committees (active):

1. Rachel Becknell (Wash.U.)

Graduate Thesis Committees (completed):

13. Holly Bernardo (Wash. U.)
12. Dilys Vela Diaz (Wash. U.)
11. Chris Catano (Wash. U.)
10. Bohema Adu-Oppong (Wash. U.)
9. Jennifer Gruhn (Wash. U.)
8. Emma Moran (Wash. U.)
7. Adriana Corrales (University of Illinois – Urbana)
6. Lauren Woods (Wash. U.)
5. Kevin Forsberg (Wash. U.)
4. Vitas Wagner (Wash. U.)
3. Vincenzo Ellis (University of Missouri – St. Louis)
2. Steven Preskitt (Frostburg State University)

1. Michaela Halsey (Frostburg State University)

Senior Undergraduate Honors Thesis Reader

1. Vanessa Hensley (Spring 2013)

Reviewer for:

National Science Foundation (external reviewer); American Journal of Botany; American Naturalist; Arthropod-Plant Interactions, Biotropica; Ecology; Ecology Letters; Evolution; Methods in Ecology and Evolution, FEMS Microbiology Ecology; Journal of Ecology; Journal of Tropical Ecology; Molecular Ecology; Mycorrhiza; Nature; Nature Communications; New Phytologist; Oecologia; Oikos; Perspectives in Plant Ecology; Evolution and Systematics; Plant Ecology; Plant and Soil; Plos ONE; PNAS; The American Midland Naturalist

**CONFERENCES AND INVITED TALKS**

38. Oklahoma State University. Integrating soil-borne organisms into major themes in plant ecology. March 2020 (invited talk).
37. Arkansas State University. Soil-borne disease agents are powerful drivers of plant community diversity. February 2020 (invited talk).
36. University of Kansas. Does competition really rule the world? Plant-microbial interactions as drivers of plant diversity. February 2019 (invited talk).
35. Ecological Society of America. Testing the link between plant-soil feedbacks and temporal dynamics of herbaceous plant communities. August 2018 (invited symposium)
34. Ecological Society of America. Plant-microbial feedbacks, phylogenetic relatedness and community assembly in tallgrass prairies. August 2017 (invited symposium).
33. University of Indiana – Bloomington. Plant-microbial interactions as stabilizing forces for the maintenance of plant diversity. March 2017 (invited talk).
32. Tulane University. From Missouri to Panama: Plant-soil feedbacks and species coexistence. March 2017 (invited talk).
31. St. Louis University. From Missouri to Panama: Experimental tests of the importance of plant-microbial interactions on species diversity. January 2017 (invited talk).
30. Smithsonian Tropical Research Institute. Negative plant-soil feedback predicts (more than just) relative abundance of tree species in a tropical forest. STRI Symposium: Tropical Microbial Ecology & Evolution. October 2016 (invited talk).
29. Southern Illinois University – Edwardsville. Plant-enemy interactions and the maintenance of plant species diversity. March 2016 (invited talk).
28. Ecological Society of America Annual Meeting. Enemy-mediated negative feedbacks trump

- competitive interactions as stabilizing forces that maintain the diversity of prairie ecosystems. Baltimore, Maryland. August 2015 (invited symposium).
27. University of Maryland. Plant-enemy interactions and the maintenance of plant species diversity. March 2015 (invited talk).
  26. University of Illinois – Champaign-Urbana. Plant-enemy interactions and the relative abundance of tropical trees. October 2014 (invited talk).
  25. University of Northern Arizona. Plant-enemy interactions and the relative abundance of tropical trees. October 2014 (invited talk).
  24. University of Missouri – St. Louis. Soil-borne enemies as determinants of tropical tree diversity. April 2013 (invited talk).
  23. St. Louis Ecology Evolution Conservation. Integrating soil-borne organisms into major themes in plant ecology. Principia College, Illinois. September 2012 (invited talk).
  22. University of Nevada – Reno. Plant-soil feedbacks and the maintenance of tropical tree diversity. Reno, Nevada. March 2012 (invited talk).
  21. Washington University. Negative plant-soil feedback and the maintenance of diversity and relative species abundance in tree communities. St. Louis, Missouri. November 2011 (invited talk).
  20. Frostburg State University. Plant-soil feedbacks and the maintenance of tropical tree diversity. Frostburg, Maryland. November 2011 (invited talk).
  19. Smithsonian Tropical Research Institute Tupper Seminar Series. Plant-soil feedbacks and the maintenance of high species diversity in a tropical forest. Panama City, Panama, October 2011 (invited talk).
  18. Ecological Society of America Annual Meeting. Oomycetes do not directly drive plant-soil feedbacks in a tropical forest. Austin, Texas, August 2011.
  17. Tyson Research Center. Plant-soil feedback and the maintenance of high species diversity in a tropical forest. St. Louis, Missouri, July 2011 (invited talk).
  16. Botanical Society of America Annual Meeting. Soil biotic communities influence tropical forest composition via plant-soil feedbacks. St. Louis, Missouri, July 2011 (invited symposium).
  15. University of Tennessee. Soil biotic communities influence tropical forest composition via plant-soil feedbacks. Knoxville, Tennessee, November 2010 (invited talk).
  14. Smithsonian Tropical Research Institute Fellowship Symposium. Negative plant-soil feedbacks predict relative tree species abundance. Panama City, Panama, March 2010.
  13. Ecological Society of America Annual Meeting. Relative abundances of tropical trees arise from species-specific differences in strengths of negative plant-soil feedback. Albuquerque, New Mexico, August 2009.

12. Workshop on Mycorrhizas in Tropical Forests. AMF species composition and its importance to tropical tree seedlings. Loja, Ecuador, October 2008.
11. Ecological Society of America annual meeting. The importance of soil biota in driving negative plant-soil feedback in a tropical forest. Milwaukee, Wisconsin, August 2008 (invited symposium).
10. STRI Symposium in Tropical Biology. Plant-fungal feedback: although out of sight, should arbuscular mycorrhizal fungi remain out of mind? Panama City, Panama, July 2005.
9. Smithsonian Tropical Research Institute. Rodent-fungal interactions and the composition of tropical forests: looking beyond seeds and toward roots. Panama City, Panama, October 2002.
8. Association for Tropical Biology, 2002 annual meeting (Panama). Implications of rodent-mediated spore dispersal for plant-mycorrhizal fungal interactions.
7. Smithsonian Tropical Research Institute. Trees, Fungi, and Rats: the dispersal of AMF spores by a Neotropical rodent. Panama City, Panama, July 2000.
6. Zoological Society of Milwaukee County Conservation Symposium. Seasonal dispersal of spores of mycorrhizal fungi by a Neotropical rodent. Milwaukee, Wisconsin, November 1999.
5. 18th Annual Meeting of the Midwest Ecology and Evolution Conference. The influence of fruit availability on the consumption of VA mycorrhizae by *Proechimys semispinosus* (spiny rat). Eastern Illinois University, April 1998.
4. 16th Annual Meeting of the Midwest Ecology and Evolution Conference. Mycophagy by *Proechimys semispinosus* (the spiny rat): a potential AM fungal spore dispersal agent. Michigan State University, April 1996.
3. Ecological Society of America Annual Meeting (poster). Lianas and saplings have similar effects on Seedling performance in a tropical forest understory. Pittsburgh, Pennsylvania, August 2010 (junior author; senior author: Alexandra J. Wright).
2. Ecological Society of America Annual Meeting (poster). Do lianas and tree saplings limit the use of water by canopy trees in a seasonal tropical forest? Milwaukee, Wisconsin, August 2008
1. Fourth International Conference on Mycorrhizae (poster). Exploring the ecological and evolutionary implication of AMF spore dispersal by neotropical rodents. Montreal, Canada, 2003.