

CURRICULUM VITAE: MICHAEL FRED ALLEN

e-mail: Michael.allen@ucr.edu

Department of Microbiology and Plant Pathology
University of California, Riverside, CA 92521

Ph.D. Botany University of Wyoming 1980
M.S. Botany University of Wyoming 1977
B.S. Biology Southwestern College, KS 1974

Distinguished Professor Emeritus, 2017-present
Director of Scientific Research, Rhizosystems LLC.
Distinguished Professor, University of California-Riverside, 2015 to 2017
Chair, Department of Biology, University of California-Riverside, 2014-2017.
Director, Center for Conservation Biology, University of California-Riverside. 1998-2017
Chair, Department of Plant Pathology and Microbiology, University of California-Riverside,
2004-2010, 2011-2012.
Professor, Department of Plant Pathology and Microbiology, University of California-
Riverside. 1998-2015
Professor, Department of Biology, University of California-Riverside. 1998-present
Professor, Dept of Biology, San Diego State University. 1991-1999
Program Officer, Division of Environmental Biology, National Science Foundation. 1993-
1995.
Associate Professor, Dept. of Biology, San Diego State University. 1988-91
Research Assistant Professor, Dept. of Biology, Utah State University. 1981-1988.
Research Associate, Dept. of Plant Pathology, University of Nebraska. 1980-1981.

PROFESSIONAL AWARDS

Distinguished Service Award, University of California, Riverside. 2015.
George Miksch Sutton Award for top conservation paper for the Southwestern Naturalists
Association, 2011.
American Association for the Advancement of Science Fellow, 2005
Southwestern College Natural Sciences Hall of Fame, 2003.
American Planning Association, Inland Empire Section. Distinguished Leadership-Academic
Award, 2003.
Chevron Conservation Award, 1999
Mycological Society of America Graduate Fellowship, 1979.
Who's Who in American Colleges and Universities, 1974.
Letter, tennis. Southwestern College, 1974.
Concertmaster, Southwestern College Orchestra, 1971-2.
President, Student Council, Southwestern College, 1972-3.

PROFESSIONAL INTERESTS

The ecology of microbial-plant-soil interactions. My interests focus on the regulation of
community and ecosystem processes by soil organisms with special emphasis on
mycorrhizal fungi. My current research concentrates on global change dynamics and

structure of undisturbed areas, and how that information can be utilized in the conservation and restoration of native ecosystems and in sustainable agriculture.

FIVE SYNERGISTIC ACTIVITIES

I have been working to understand desert ecosystem processes for decades. I have worked on or visited deserts in every region of the globe, and have written both research papers and white papers for organizations advising desert conservation programs. Beginning in 2026, I am a co-organizer for a new **Keck Institute for Space Studies workshop on Crucial Carbon Stores and Fluxes in Desert Environments.**

<https://www.kiss.caltech.edu/impact/2026_programs.html>

I work on information transfer from soil ecology and plant-microbial symbiosis that influence **sustainability** in agriculture and forestry. My focal work is in **California** with colleagues at UC Merced, and in the **Yucatán Peninsula**, in collaboration with faculty at the Universidad Autónoma de Yucatán (UADY) where we are working on carbon sequestration and food/fiber production in sustainable, swidden agriculture, scaling from carbon dynamics of fungal hyphae to the regional scale, using, modifying, and developing technologies from soil sensors to drones to remote sensing, and working in communities, the field and lab, and undertaking technical high school workshops. In this context, I initiated and continue to work on solar energy sustainability, particularly with siting issues and implications for agriculture and for wildland conservation. My work in this area included support for a Fellow for the **RIFA program** (Research and Innovation Fellowship for Agriculture- UC Davis) for 2018, Ayesha Peterson of UCSB, with Juan Jiménez-Osornio and Héctor Estrada Medina of UADY, initial support for research on real carbon exchange and energy land-use decisions in agriculture and desert ecosystems, and leading the US team for the **Food and Nutrition Security in the Americas: A View from the Academies of Sciences.** Michael T. Clegg (coordinator) in Mexico City. This work was published as Challenges and Opportunities for Food and Nutrition Security in the United States, pp. 506-531, and as Box 4, Improving Production Efficiencies at Small-to-Medium Scales: Using Microbial Symbiosis, pp. 422-425, In, Food and Nutrition Security in the Americas: A View from the Academies of Sciences. Michael T. Clegg (coordinator). Inter-American Network of Academies of Sciences. Mexican Academy of Sciences, Mexico City.

I continue to undertake research on the role of mycorrhizae in restoration and conservation of disturbed lands. For this research, I was elected as a **AAAS Fellow** in 2005 and received the **Chevron Conservation Award** in 1999. I continued to work on the impacts of global change in soil biology, including serving as the **Chair** of the **Soil Ecology Section** for the Ecological Society of America 2011-2013, and **Chair** of the **International Mycorrhiza Society** 2012-2015.

I undertook multiple community-scale projects facilitating or reviewing regional **Habitat Conservation Plans** supported by local and regional agencies. These have been recognized by local agencies for which I received the **American Planning Association, Inland Empire Section, Distinguished Leadership-Academic Award** for 2003. The **Center for Conservation Biology**, which I directed, oversaw the Preparatory Data Collecting and Organizing to establish the Western Riverside County Multiple Species Conservation award < <https://www.wrc-rca.org> >, and the Coachella Valley Multiple Species Conservation Program < <https://cvmshcp.org> >. Upon establishment, we set up

the monitoring program for the Coachella Valley Multiple Species Habitat Conservation Plan, and advises the Western Riverside County Regional Conservation Authority for land acquisition issues and monitoring.

I participated in discussions and meetings on the National Ecological Observatory Network (**NEON**) since its inception. This has included participating in the original NSF discussions on a continental-scale research program (beginning in 1995, as a program officer), the Biological Observatory Network (**BON**) in 1998, as a member of the Infrastructure for Biology at Regional to Continental Scales (**IBRCS**) Working Group (IBRCS White Paper: Rationale, Blueprint, and Expectations for the National Ecological Observatory Network. Washington, D.C: American Institute of Biological Sciences. 68 pp.), and as organizer and lead author for the workshop on Biodiversity and Ecosystem Functioning. I was past Chair of the Domain Science and Education Coordinating Committee (Domain 17). For additional information, see *Oral History of Michael Allen, August 21, 2024, the Who, What, and Where of the National Ecological Observatory Network (NEON)*, in prep. During my work NEON, I helped organize the research on microbial ecology, including the workshop on microbial ecology at Baton Rouge Feb 2008, the North American Carbon Program, US-Mexico Science Coordination Workshop, Oct 2004, Mexico City, the NCEAS workshop on Microbes and Ecosystems, the Microbial Ecology Steering Committee for the Sustainable Biosphere Initiative, 1992, and the Workshop on the mission of a National Center for Ecological Synthesis and Analysis, National Science Foundation, Albuquerque, NM. Oct 1992.

PROFESSIONAL ACTIVITIES

Board of Trustees, 2025-present. **Southwestern College**, Winfield Kansas.

Member: Ecological Society of America, Sigma Xi, Mycological Society of America.

Program Director, **National Science Foundation**, 1993-1995. Program Director, Long-Term Programs in Environmental Biology. Programs Managed: Ecosystems Studies, Long-Term Ecological Research (LTER), Land-Margin Ecological Research (LMER), Long-Term Research in Environmental Biology (LTREB), Conservation and Restoration Biology (CRB).

Chair, Soil Ecology Section of the **Ecological Society of America**, 2011-2013.

President, **International Mycorrhizal Society**, 2012-2015.

Invited Speaker and Participant, DOE workshops on Sensing, Modeling, and Root-Microbial Dynamics. Oak Ridge National Lab (2), Argonne National Lab, Washington DC, 2012-2014.

Invited Speaker and Participant, NEON workshop on Microbial Ecology, Baton Rouge, LA, February 2008, Boulder, CO, October 2008.

Invited Speaker and Participant, Workshop on Current Research on Effects of GEOs on Terrestrial and Aquatic Wildlife and Habitats: “Ecological effects of GE microbes on wildlife and their habitats”. Board on Agriculture and Natural Resources of The National Academies. Irvine, CA November 2007.

Selected Participant, UC Senior Leadership Institute (UCSLI), Fulfilling Our Mission: Building on Excellence and Understanding Leadership. San Diego, CA. June 2007.

Member, Infrastructure of Biology at Regional to Continental Scales (IBRCS) Working Group, AIBS. Holsinger, K.E. and the IBRCS Working Group (M.F. Allen et al.). 2003. IBRCS White Paper: Rationale, Blueprint, and Expectations for the National Ecological Observatory Network. Washington, D.C: AIBS. 68 pp.

Lead Organizer and writer, NEON Science Workshop: Biodiversity, species composition and ecosystem functioning. American Institute of Biological Sciences. 2004. Report from a NEON Science Workshop. Washington DC: AIBS. PI, RFI's on the PSWEON Core, and on Biodiversity documentations.

Advisory Panel for the Evolutionary and Population Ecology Program, Division of Environmental Biology, National Science Foundation, 2006.

Chair, Scientific Review panels for Multiple Species Habitat Conservation Plans for western Riverside County, Northern and Eastern Colorado Desert.

Participant, in North American Carbon Program, US-Mexico Science Coordination Workshop, October 2004, Mexico City

Participant, National Center for Ecological Synthesis and Analysis workgroup on Microbes and Ecosystems: 2004-present, Santa Barbara.

Participant in workshop on Use of molecular techniques in Ecology, Sponsored by the U.S. National Science Foundation and European Union, October 1999.

Participant in workshop on Roots. 5th New Phytologist Symposium sponsored by GCTE (Global Change in Terrestrial Ecosystems), Townsend, TN, October 1999.

Advisory Panel for EPSCoR Program, National Science Foundation, 2005.

Panelist, Workshop on Biodiversity Observatories. National Science Foundation, Blandy Farms, University of Virginia September 1998. Bowers, M., Chair. 1998. Final Report: Biodiversity Monitoring Workshop. <http://www.vcrlter.virginia.edu/biodwrk98/>

Panelist, Workshop of Conceptual Issues in Restoration Ecology, National Science Foundation, NCEAS, Santa Barbara, CA April 1996.

Advisory Panel for US Department of Agriculture, NRI, Soils and soil biology. 2002, 2003.

Advisory Panel for the Ecology Program, Division of Environmental Biology, National Science Foundation, 1996-2000.

Advisory Panel for US Department of Energy, Post-doctoral Fellowships in Global Change. 1995

Advisory Panel for the US Department of Agriculture National Research Initiative, Ecosystem Sciences. 1991

Advisory Panel for US Environmental Protection Agency, Office of Research and Development, Environmental Biology. 1990-1992.

Advisory Panel for Ecosystems Studies Program, Division of Biotic Systems Resources, National Science Foundation. 1986-1989.

Microbial Ecology Steering Committee for the Sustainable Biosphere Initiative, Ecological Society of America 1992.

Panelist, Workshop on the influence of increasing CO₂ on belowground processes, Michigan Biological Station, May 1993.

Panelist, Workshop on the mission of a National Center for Ecological Synthesis and Analysis, National Science Foundation, Albuquerque, NM. Oct 1992.

Editorial Board, *The Biology and Fertility of Soils*.

Associate Editor, *EcoSphere*, 2013-2022

Founding Editor, *Mycorrhiza*. 1990-1996, editorial board, 1996- present.

Associate Editor, *Vadose Zone*, 2006-2009.

Associate Editor, *Mycological Research*. 1996-2001.

Associate Editor, *Journal of Arid Land*. 2010-present.

Co-Organizer, 8th North American Conference on Mycorrhizae, 1990, Jackson Hole, WY; organizing committee, 8th International Conference on Mycorrhiza, 2015, Flagstaff, AZ. Mycological Society of America: Annual Lecturer Committee, 1987-1989, Chair 1989. Ecology Committee, 1989-1991, 1991-1994, Chair 1990-1991, 1993-1994. Councilor, Ecology and Pathology. 1992-1994. Representative to the National Institute of the Environment Initiative. 1991-2000, Annual Lecturer Committee 2002-3, Ecology Committee 2002-2005. Science Advisor, Rhizosystems, LLC. Camas, Washington, <<https://rhizosystems.com/>>.

PUBLICATIONS

Books:

- Allen, M.F. 2022. *Mycorrhizal Dynamics in Ecological Systems*. Cambridge University Press. DOI: 10.1017/9781139020299. Received 2022 American Library Association **Choice Award** for '**Outstanding Academic Title 2023**'.
- Gomez-Pompa, A., M.F. Allen, S. Fedick, and J.J. Jimenez-Osornio. 2003. *Lowland Maya Area: Three millennia at the human-wildland interface*. Haworth Press, N.Y. 659 pp.
- Allen, M.F. 1991. *The Ecology of Mycorrhizae*. Cambridge University Press. Cambridge Studies in Ecology series.
- Allen, M.F. (ed.) 1992. *Mycorrhizal Functioning*. Chapman Hall.
- Williams, S.E. & M.F. Allen (eds). 1984. *VA mycorrhizae and reclamation of arid and semiarid lands*. University of Wyoming Experiment Station. 91 pp.

Theses:

- Allen, M.F. 1977. Decomposition of six litter types under controlled conditions: a study of rates and decomposing organisms. M.S. Thesis, Dept. of Botany, University of Wyoming, Laramie. Martha Christensen, Major Professor.
- Allen, M.F. 1980. Physiological alterations associated with vesicular-arbuscular mycorrhizal infection of *Bouteloua gracilis*. PhD Dissertation, Dept. of Botany, University of Wyoming, Laramie. Martha Christensen, Major Professor.

Editorial Commentaries

- Dr. Michael Allen. 2024. Oak mycorrhizal soil carbon storage and hydrology. Oaks' Spring-Summer 24 Newsletter: p4.
- Dr. Michael Allen et al. 2024. The California Desert's Role in 30x30: Carbon Sequestration and Biodiversity. February 6, 2024. 34 pages.
- Dr.'s Thomas Harmon and Michael Allen: Leafcutter ant colonies may be an overlooked source of carbon dioxide emissions, new study finds, <https://blogs.agu.org/geospace/2018/12/17/leafcutter-ant-colonies-may-be-an-overlooked-source-of-carbon-dioxide-emissions-new-study-finds/>
- Dr. Michael Allen: California desert monuments long overdue, (please open link in Internet Explorer or Chrome, does not work in Firefox), <http://www.pe.com/articles/desert-795101-national-monument.html>
- SOLAR POWR: UCR Study touts small local projects (please open link in Internet Explorer or Chrome, does not work in Firefox), <http://www.pe.com/articles/solar-787409-projects-study.html>

[Scientific American](#), [The Desert Sun](#) and [others](#) highlight collaborative research at UCR that finds that many solar farms in California pose a threat to desert life because they are not situated in “potentially compatible” areas that minimize its harm to wildlife. Michael Allen and Alan McHughen: Harness sun wisely. Don't let solar projects trample the environment. *Local Views, Press Enterprise*. December 25, 2010.

Special Reports:

- Bernstein, Jules. 2024. How gophers brought Mount St. Helens back to life in one day. <https://news.ucr.edu/articles/2024/11/05/how-gophers-brought-mount-st-helens-back-life-one-day>. A press release of the work published in Maltz et al. 2024 (below).
- Allen, M.F. and C. Barrows. 2024. The ecology of the Salton Sea Basin: The key is Variability. Salton Sea Forum Reports, BREATHE Center. University of California, Riverside. https://saltonseaforum.ucr.edu/sites/default/files/2024-06/the-ecology-of-the-salton-sea-basin_allen2024_0.pdf.
- Allen, M.F. 2019. Carbon credits and the Western Riverside County Multiple Species Habitat Plan. Report to the Western Riverside County Regional Conservation Authority. 10 pgs.
- Allen, M.F., T. Stanton, E.B. Allen, G.D. Jenerette, H. Estrada-Medina, J. Jiménez-Osornio, and T. Harmon. 2016. The role of environmental change on the human-wildland interface: The Lowland Maya as a model study system. Report to Working Group on Environment, UC Mexico Initiative.
- Barrows, Cameron, Michael Allen, Kathleen Fleming, and Kuni Kitajima. 2014. Factors contributing to persistence and decline of mesquite dune hummock communities in the Coachella Valley. Report to the Coachella Valley Conservation Commission. Palm Desert, CA.
- Allen, M. F., G. D. Jenerette, L. S. Santiago. 2013. Carbon Balance in California Deserts: Impacts of Widespread Solar Power Generation. California Energy Commission. Publication number: CEC-500-2013-063. <https://escholarship.org/uc/item/5cn2d5q5>
- Allen, M.F. J. Bartolome, M. Doran, V. Eviner, and M. Kelly. 2011. Strategic Plan for Sustainable Natural Ecosystems Initiative. April 7, 2011.
- Allen, M.F. and K. Preston. 2006. Core 2 Refinement workshop report. <https://escholarship.org/uc/item/3fc8m55f>
- Allen, M.F., B. Mishler, and C. Moritz. 2004. American Institute of Biological Sciences. 2004. Biodiversity, Species Composition, and Ecosystem Functioning: Report from a NEON Science Workshop. Washington, DC: AIBS.
- Allen, M.F., T.A. Scott, E.B. Allen, S. Boyd, R. Minnich, J. Malcolm, L. Nunney, R. Redak, and D. Reznick. 2003. Scientific Review Panel Review of: Draft Western Riverside County MSHCP Document. <https://escholarship.org/uc/item/1bg8h89c>

Referred Papers and Book Chapters:

- Fernandez-Bou, A.S., L.M. Classen-Rodriguez, P.W. Rundel, T.C. Harmon, M.F. Allen, C.L. de la Rosa, and L. Schwendenmann. In press. Carbon and nitrogen fluxes in leaf-cutter ant sites in a changing climate. Chapter 19 in: I.R. Leal, F.M.P. Oliveira, X. Arnan, and A. Andersen. *Ant Responses to Climate Change: From Individuals to Ecosystem Services*. Springer.
- Maltz, M.R., M.F. Allen, M.L. Phillips, R. Hernandez, H.B. Shulman, H.L. Freud, L.V. Andrews, J. Bothoff, E.L. Aronson. 2024. Microbial community structure in recovering

- forests of Mount St. Helens. *Frontiers in Microbiomes* 3:1399416.doi: 10.3389/frmbi.2024.1399416.
- Parmenter, R.R., P. MacMahon, J.F. Mull, T.O.Crist, C.M. Crisafulli, and M.F. Allen. 2024. Resolution of Respect: James A. MacMahon (1939-2024). *Bill. Ecol. Soc Am* e02190. <https://doi.org/10.1002/bes2.2190>.
- Shulman, H.B., E. L. Aronson, D. Dierick, A. A. Pinto-Tomás, J. K. Bothoff, A. Artavia-León, and M. F. Allen. 2024. Leafcutter ants enhance Microbial drought response in tropical forest soil. *Environmental Microbiology Reports*. 2024;16e13251 DOI: 10.1111/1758-2229.13251
- Manrique-Caamal S., Estrada-Medina H., Jiménez-Osornio J.J., Allen M F., Allen E.B., Barrientos M.R.C., Álvarez-Rivera, O.O. 2024. Glomeromycotina guild spore abundance correlates with soil organic carbon in homegardens and seasonal forests in Yucatan, Mexico. *Revista Terra Latinoamerica* 42: 1-10.<https://doi.org/10.28940/terra.v42i0.1812>
- Allen, M. F., H. Shulman, P. W. Rundel, T. C. Harmon, and E. L. Aronson. 2023. Leafcutter ants – mycorrhizal fungi: observations and research questions from an unexpected mutualism. *Frontiers in Fungal Biology* 4. 1241916. DOI: 10.3389/ffunb.2023.1241916
- Rundel, P.W.; Harmon, T.C.; Fernandez-Bou, A.S.; Allen, M.F. 2023. Collaborative Use of Sensor Networks and Cyberinfrastructure to Understand Complex Ecosystem Interactions in a Tropical Rainforest: Challenges and Lessons Learned. *Sensors* 2023, 23, 9081. <https://doi.org/10.3390/s23229081>
- Taniguchi, T., Isobe, K., Imada, S., Eltayeb, M.M., Akaji, Y., Nakayama, M., Allen, M.F., Aronson, E.L. 2023. Root endophytic bacterial and fungal communities in a natural hot desert are differentially regulated in dry and wet seasons by stochastic processes and functional traits. *Science of the Total Environment*. 899: 165524. <https://doi.org/10.1016/j.scitotenv.2023.165524>
- Allen, M.F. and B.D. Mishler. 2022. A phylogenetic approach to conservation: Biodiversity and ecosystem functioning for a changing globe. Chapter 8, pp 155-177 in *Speciesism and the Future of Humanity: Biology, Culture, and Sociopolitics*. Springer <10.1007/978-3-030-99031-2_8>.
- Defrenne, C., J. Childs, C. Fernandez, M. Taggart, M. Allen, P. Hanson, and C. Iversen. 2021. High-resolution minirhizotrons in an experimentally-warmed peatland provide an unprecedented glimpse at fine roots and their fungal partners. *Plants, People, Planet*. 3:640-652. DOI: 10.1002/ppp3.10172.
- Fernandez-Bou, A. S., D. Dierick, M.F. Allen, and T.C. Harmon. 2020. Precipitation-drainage cycles lead to hot moments in soil carbon dioxide in a neotropical wet forest. *Global Change Biology* 26:5303-5319. DOI: 10.1111/gcb.15194.
- Phillips, M.L., B. McNellis, M.F. Allen, and E.B. Allen. 2019. Differences in root phenology and water depletion by an invasive grass explains persistence in a Mediterranean ecosystem. *American Journal of Botany* 106: 1210–1218. doi:10.1002/ajb2.1344.
- Frie, A, A Garrison, M Schaefer, S Bates, J Botthoff, M Maltz, S Ying, T Lyons, MF Allen, EL Aronson, R Bahreini. 2019. "Dust Sources in the Salton Sea Basin: A Clear Case of an Anthropogenically Impacted Dust Budget." *Environmental Science & Technology*. 53(16):9378-9388. doi: 10.1021/acs.est.9b02137.
- Aronson, E.L., D. Dierick, J. K. Botthoff, S. Oberbauer, T. J. Zelikova, T. Harmon, P. Rundel, R.F. Johnson, A.C. Swanson, M.F. Allen. 2019. ENSO-Influenced Soil Moisture and Drought Drive Methane Flux Dynamics in a Costa Rican Rainforest Soil. *Journal of*

- Geophysical Research - Biogeosciences, 124: 2267-2276.
<https://doi.org/10.1029/2018JG004832>.
- Hernandez, R., A. Armstrong, J. Burney, G. Ryan, K. Moore-O'Leary, I. Diédhiou, R. Davis, S. Grodsky, L. Saul-Gershenz, J. Macknick, D. Mulvaney, G. Heath, S. Easter, M. Hoffacker, M.F., Allen, and D. Kammen, 2019. Techno-ecological synergies of solar energy for global sustainability. *Nature Sustainability* 2: 560-568.
<https://doi.org/10.1038/s41893-019-0309-z>
- Phillips, M.L. S.E. Weber, L.V. Andrews, E.L. Aronson, M.F. Allen and E.B. Allen. 2019. Fungal community assembly in soils and roots under plant invasion and nitrogen deposition. *Fungal Ecology* 40: 107-117. <https://doi.org/10.1016/j.funeco.2019.01.002>
- Weber, S.E., J.M. Diez, L.V. Andrews, M.L. Goulden, E.L. Aronson, and M.F. Allen. 2019. Responses of arbuscular mycorrhizal fungi to multiple coinciding global change drivers. *Fungal Ecology* 40: 62-71. DOI: 10.1016/j.funeco.2018.11.008
- Swanson, A., L. Schwendenmann, M.F. Allen, E. Aronson, A. Artavia-León, D. Dietick, A. Fernandez-Bou, T. Harmon, C. Murillo-Cruz, S. Oberbauer, A. Pinto-Tomás, P. Rundel, and T. Zelikova. 2019. Welcome to the *Atta* world: A framework for understanding the effects of leaf-cutter ants on ecosystem functions. *Functional Ecology*. 33: 1386-1399. DOI: 10.1111/1365-2435.13319
- Allen, M.F., D. E. Tuthill, J. States, S. E. Williams and T. W. Henkel. 2019. In memoriam: Martha Christensen, 1932–2017. *Mycologia*, DOI: 10.1080/00275514.2018.1544815.
- Fernandez-Bou, A.S., D. Dierick, A.C. Swanson, M.F. Allen, A.G.F. Alvarado, A. Artavia-León, O. Carrasquillo-Quintana, D.A. Lachman, S. Oberbauer, A. Pinto-Tomás, Y. Rodríguez-Reyes, P. Rundel, L. Schwendenmann, T.J. Zelikova, and T.C. Harmon. 2019. The Role of the Ecosystem Engineer, the Leaf-Cutter Ant *Atta cephalotes*, on Soil CO₂ Dynamics in a Wet Tropical Rainforest. *Journal of Geophysical Research. Biogeosciences*. 124: 260-273. DOI: 10.1029/2018JG004723
- Taniguchi T., Kitajima K., Douhan GW, Yamanaka N., and Allen MF. 2018. A pulse of summer precipitation after the dry season triggers changes in ectomycorrhizal formation, diversity, and community composition in a Mediterranean forest in California, USA. *Mycorrhiza* 28: 665-677. <https://doi.org/10.1007/s00572-018-0859-3>
- Aburto-Oropeza, O. et al. 2018. Harnessing cross-border resources to confront climate change. *Environmental Science and Policy* 87: 128-132. DOI: 10.1016/j.envsci.2018.01.001.
- Allen, M.F. Matthew R. O'Neill, Charles M. Crisafulli, and James A. MacMahon. 2018. Succession and mycorrhizae on Mount St. Helens. pp 199-216. In: V.H. Dale and C.M. Crisafulli. *Ecological Responses at Mount St. Helens: Revisited 35 years after the 1980 eruption*. Springer.
- Hoffacker, M. K., M. F. Allen and R. R. Hernandez. 2017. Land sparing opportunities for solar energy development in agricultural landscapes: A case study of the Great Central Valley, CA, USA. *Environmental Science & Technology* 51: 14472-14482. DOI: [10.1021/acs.est.7b05110](https://doi.org/10.1021/acs.est.7b05110)
- Allen, Michael F., Peter L. Morrell, Charles W. Rice, Henry J. Vaux, Clifford N. Dahm, and Rebecca R. Hernandez. 2017. Challenges and Opportunities for Food and Nutrition Security in the United States. In, *Food and Nutrition Security in the Americas: A View from the Academies of Sciences*. Michael T. Clegg (coordinator). Inter-American Network of Academies of Sciences. Mexican Academy of Sciences, Mexico City.

- <https://ianas.org/wp-content/uploads/2020/07/fnb02c-1.pdf>
- Allen, M.F. 2017. Box 4: Improving production efficiencies at small-to-medium scales: Using microbial symbioses. pp 422-425 in: Food and Nutrition Security in the Americas: A View from the Academies of Sciences. Michael T. Clegg (coordinator). Inter-American Network of Academies of Sciences. Mexican Academy of Sciences, Mexico City.
<https://ianas.org/wp-content/uploads/2020/07/fnb02c-1.pdf>
- VanTassel, H.L.H., Bell, M.D., Rotenberry, J., Johnson, R. and Allen, M.F. 2017. Environmental change, shifting geographical distributions, and habitat conservation plans: A case study of the California Gnatcatcher. *Ecology and Evolution* 2017; 1-13. DOI: 10.1002/ece3.3482
- Allen, M.F. and E.B. Allen. 2017. Mycorrhizal mediation of soil fertility amidst nitrogen eutrophication and climate change. Chapt. 12, pp 213-231, In N.C. Johnson, C. Gehring and J. Jansa, eds. *Mycorrhizal Mediation of Soil: Fertility, Structure, and Carbon Storage*. Elsevier Press, Amsterdam.
- Morris, S.J., C.F. Friese, and M.F. Allen. 2016. Disturbance in natural ecosystems: scaling from fungal diversity to ecosystem functioning. In: I.S. Druzhinina and C.P. Kubicek (eds) *Environmental and Microbial Relationships*, 3rd Edition, *The Mycota IV*. Springer International Publishing Switzerland.
- Pivovarov, A.L. L.S. Santiago, G.L. Vourlitis, D.A. Grantz, and M.F. Allen. 2016. Plant hydraulic responses to long-term dry season nitrogen deposition alter drought tolerance in a Mediterranean-type ecosystem. *Oecologia* DOI 10.1007/s00442-016-3609-2
- Allen, M.F. 2016. If you want to understand nature, stick your head in the sand! *LA+ Interdisciplinary Journal of Landscape Architecture*. Fall/2016: 16-21.
- Murphy-Mariscal, M.L., C.W. Barrows and M.F. Allen 2015. Native Wildlife Use Of Highway Underpasses In A Desert Environment. *Southwestern Naturalist* 60: 340-348. DOI: <http://dx.doi.org/10.1894/0038-4909-60.4.340>.
- Allen, M.F. 2015. How oaks respond to water. pp 13-22 In Standiford, R. B.; Purcell, K. L., tech. cords. 2015. Proceedings of the seventh California oak symposium: managing oak woodlands in a dynamic world. Gen. Tech. Rep. PSW-GTR-251. Berkeley, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 579 p.
- Hernandez, R.R., M.K. Hoffacker, M.L. Murphy-Mariscal, G. Wu and M.F. Allen. 2015. Solar energy development impacts on land-cover change and protected areas. *Proceedings of the National Academy of Sciences, USA*. 112: 13579-14584. www.pnas.org/cgi/doi/10.1073/pnas.1517656112.
- Harmon, T.C., D. Dierick, N. Trahan, M.F. Allen, P Rundel, S. Oberbauer, L. Schwendenmann, and T.J. Zelikova. 2015. Low cost soil CO₂ efflux and point concentration sensing systems for terrestrial ecology applications. *Methods in Ecology and Evolution*. Doi: 10.1111/2041-210X.12426. 5p.
- Allen, M.F. and K. Kitajima. 2014. Net primary production of ectomycorrhizas in a California forest. *Fungal Ecology* 10: 81-90. <http://dx.doi.org/10.1016/j.funeco.2014.01.007>.
- Allen, M.F., C.W. Barrows, M.D. Bell, G.D. Jenerette, R.F. Johnson, and E.B. Allen. 2014. Threats to California's Desert Ecosystems. *Fremontia* 42: 3-8.
- Allen, M.F., K. Kitajima, R.R. Hernandez. 2014. Mycorrhizae and global change. Pp. 37-59: in M. Tausz, N.E. Grulke (eds). *Trees in a changing environment*. Springer- Plant Sciences, Dordrecht, The Netherlands.
- Droser, M.L., G.G. Gehling, M.E. Dzaugis, M.J. Kennedy, D. Rice, and M.F. Allen. 2014. A

- new Ediacaran fossil with a novel sediment displacive life habit. *Journal of Paleontology* 88: 145-151.
- Hernandez, R.R., S.B. Easter, M.L. Murphy-Mariscal, F.T. Maestre, M. Tavassoli, E.B. Allen, C.W. Barrows, J. Belnap, R. Ochoa-Hueso, S. Ravi, and M.F. Allen. 2014. Environmental impacts of utility-scale solar energy. *Renewable and Sustainable Energy Reviews* 29: 766-779.
- Bledsoe, C.S., M.F. Allen and D. Southworth. 2014. Beyond mutualism: Complex mycorrhizal interactions. U. Lüttge et al., (eds), *Progress in Botany* 75: DOI 10.1007/978-3-642-38797-5_10
- Kitajima, K., M.F. Allen and M.L. Goulden. 2013. Contribution of Hydraulically Lifted Deep Moisture to the Water Budget in a Southern California Mixed Forest. *Journal of Geophysical Research- Biogeosciences* 118: 1561-1572
- Allen, M.F. and K. Kitajima. 2013. In situ high frequency observations of mycorrhizas. *New Phytologist* 200: 222-228. doi: 10.1111/nph.12363. 7 pages.
- Egerton-Warburton L.M., Querejeta J.I., Allen M.F. and Finkelman S.L. . 2013. Mycorrhizal Fungi, Reference Module in Earth Systems and Environmental Sciences, Elsevier. 27-Sep-13 doi: 10.1016/B978-0-12-409548-9.05226-X.
- Hernandez, R.R. and M.F. Allen. 2013. Diurnal patterns of productivity of arbuscular mycorrhizal fungi revealed with the soil ecosystem observatory. *New Phytologist* 200: 547-557. Doi:10.1111/nph.12393
- Estrada-Medina, H., L.S. Santiago, R.C. Graham, M.F. Allen, J.J. Jiménez-Osornio. 2013. Source water, phenology and growth of two tropical dry forest tree species growing on shallow karst soils. *Trees* 27: 1297-1307. DOI 10.1007/s00468-013-0878-9
- Estrada-Medina, H., R.C. Graham, M.F. Allen, J.J. Jiménez-Osornio, and S. Robles-Casolco. 2013. The importance of limestone bedrock and dissolution karst features on tree root distribution in northern Yucatán, México. *Plant and Soil* 362:37-50. DOI 10.1007/s11104-012-1175-x
- Hernandez, R.R., M.S. Mayernik, M.L. Murphy-Mariscal, and M.F. Allen. 2012. Advanced technologies and data management practices in environmental science: Lessons from Academia. *BioScience* 62: 1067-1076. DOI: 10.1525/bio.2012.62.12.8
- Preston, K.L., R.A. Redak, M.F. Allen and J.T. Rotenberry. 2012. Changing Distribution Patterns of the Endangered Quino Checkerspot: Linking Local Extinction Patterns and Variable Habitat Relationships. *Biological Conservation* 152: 280-290. DOI: 10.1016/j.biocon.2012.03.011
- Querejeta, J.I., L.M. Egerton-Warburton, I. Prieto, R. Vargas, and M.F. Allen. 2012. Changes in soil hyphal abundance and viability can alter the patterns of hydraulic redistribution by plant roots. *Plant and Soil* 355: 63-73. DOI: 10.1007/s11104-011-1080-8
- Ladwig, L.M., S.L. Collins, A.L. Swann, Y. Xia, M.F. Allen and E.B. Allen. 2012. Above- and belowground responses to nitrogen addition in a Chihuahuan desert grassland. *Oecologia* 169: 177-185. DOI: 10.1007/s00442-011-2173-z
- Iverson, C.M., M.T. Murphy, M.F. Allen, J. Childs, D.M. Eissenstadt, E.A. Lilleskov, T.M. Sarjala, V.L. Sloan and P.E. Sullivan. 2012. Advancing the use of minirhizotrons in wetlands. *Plant and Soil* 352: 23-39. DOI: 10.1007/s11104-011-0953-1
- Rundel, P.W., M.F. Allen, E.A. Graham. 2011. Sensor networks. Prometheus Wiki. <http://prometheuswiki.publish.csiro.au/tiki-index.php?page=Sensor+networks>
- Hasselquist, N.J., G.W. Douhan, and M.F. Allen. 2011. First report of the ectomycorrhizal status of boletes on the Northern Yucatan Peninsula, Mexico determined using isotopic

- methods. *Mycorrhiza* 21: 465-471. DOI: 10.1007/s00572-010-0355-x
- Allen, M.F. 2011. Linking water and nutrients through the Vadose zone: a fungal interface between the soil and plant systems. *Journal of Arid Land* 3: 155-163. DOI: 10.3724/SP.J.1227.2011.00155
- Allen, M.F. 2011. Mycorrhizae of Oaks. pp. 68-69, In: L.R. Costello, B.W. Hagen, and K.S. Jones. *Oaks in the Urban Landscape: Selection, Care and Preservation*. University of California Agriculture and Natural Resources Pub. 3518.
- Barrows, C.W., K.D. Fleming, and M.F. Allen. 2011. Identifying Habitat Linkages to Maintain Connectivity for Corridor Dwellers in a Fragmented Landscape. *Journal of Wildlife Management* 75: 682-691. DOI: 10.1002/jwmg.138
- Kitajima, K., K.E. Anderson, and M.F. Allen. 2010. Effect of soil temperature and soil water content on fine root turnover rate in a California mixed-conifer ecosystem. *Journal of Geophysical Research- Biogeosciences*. 115: G04032. 12 pages. DOI: 10.1029/2009JG001210
- Hasselquist NJ, M.F. Allen, and L.S. Santiago. 2010. Water relations of evergreen and drought-deciduous trees along a seasonally dry tropical forest chronosequence. *Oecologia* 164: 881-890.
- Allen, M.F., E.B. Allen, J.L.Lansing, K.S. Pregitzer, R.L. Hendrick, R.W. Ruess and S.L. Collins. 2010. Responses to chronic N fertilization of ectomycorrhizal piñon but not arbuscular mycorrhizal juniper in a piñon-juniper woodland. *Journal of Arid Environments* 74: 1170-1176.
- Estrada-Medina, H., W. Tuttle, R.C. Graham, M.F. Allen, and J.J. Jiménez-Osornio. 2010. Identification of underground karst features using ground-penetrating radar (GPR) in northern Yucatán, México *Vadose Zone* 9: 653-661.
- Vargas, R., D.D. Baldocchi, M. F. Allen, M. Bahn, T. A. Black, S. L. Collins, J. Curiel Yuste, T. Hirano, R. S. Jassal, J. Pumpanen, J.Tang. 2010. Looking deeper into the soil: biophysical controls and seasonal lags of soil CO₂ production and efflux. *Ecological Applications* 20: 1569-1582.
- Vargas, R., M. Detto, D.D. Baldocchi, and M.F. Allen. 2010. Multiscale analysis of temporal variability of soil CO₂ production as influenced by weather and vegetation. *Global Change Biology*. 16: 1589-1605.
- Goode, L.K., E.B. Erhardt, L.S. Santiago, and M.F. Allen. 2010. Carbon stable isotopic composition of soluble sugars in *Tillandsia* epiphytes varies in response to shifts in habitat. *Oecologia* 163: 583-590.
- Hasselquist N.J., R. Vargas, and M.F. Allen. 2010. Using soil sensing technology to examine interactions and controls between ectomycorrhizal growth and environmental factors on soil CO₂ dynamics. *Plant and Soil* 331: 17-29.
- Hasselquist, N., L.S. Santiago, and M.F. Allen. 2010. Belowground nitrogen dynamics in relation to hurricane damage along a tropical dry forest chronosequence. *Biogeochemistry* 98: 89-100.
- McFarland, J.W., R.W. Ruess, K. Kielland, K. Pregitzer, R. Hendrick and M. Allen. 2010. Cross-ecosystem comparisons of in situ plant uptake of amino acid-N and NH₄⁺. *Ecosystems* 13: 177-193.
- Vargas, R., N. Hasselquist, E.B. Allen and M.F. Allen 2010. Effects of a hurricane disturbance on aboveground forest structure, arbuscular mycorrhizae and belowground carbon in a restored tropical forest. *Ecosystems* 13: 118-128.

- Barrows, C.W., J.T. Rotenberry, and M.F. Allen. 2010. Assessing sensitivity to climate change and drought variability of a sand dune endemic lizard. *Biological Conservation* 143: 731-736.
- Barrows, C.W. and M.F. Allen. 2010. Patterns of occurrence of reptiles across a sand dune landscape. *Journal of Arid Environments* 74: 186-192.
- Vargas, R., D.D Baldocchi, J.I. Wuerejeta, P.A. Curtis, N.J. Hasselquist, I.A. Janssens, M.F. Allen and L. Montagnani. 2010. Ecosystem CO₂ fluxes of arbuscular and ectomycorrhizal dominated vegetation types are differentially influenced by precipitation and temperature. *New Phytologist* 185: 226-236.
- Chen, X., B. –L. Li, and M.F. Allen. 2010. Characterizing urbanization, agricultural and conservation land use change in Riverside County, California, USA. *Ecological Complexity and Sustainability. Annals of the New York Academy of Sciences* 1195: E164-E176.
- Allen, M.F. 2009. Commentary. Bidirectional water flows through the soil-fungal-plant mycorrhizal continuum. *New Phytologist* 182: 290-293.
- Rundel, P., E. Graham, M.F. Allen, J.C. Fisher, and T.C. Harmon. 2009. Tansley Review. Environmental sensor networks in ecological research. *New Phytologist* 182:589-607.
- Goode, L.K. and M.F. Allen. 2009. Seed germination conditions and implications for establishment of an epiphyte, *Aechmea bracteata* (Bromeliaceae). *Plant Ecology* 204: 179-188
- Vargas, R., S.E. Trumbore, and M.F. Allen. 2009. Evidence of old carbon used to grow new fine roots in a tropical forest. *New Phytologist* 182: 710-718.
- Vargas, R., E.B. Allen, and M.F. Allen. 2009. Effects of vegetation thinning on above and belowground carbon in a seasonally dry tropical forest. *Biotropica* 41: 302-311.
- Querejeta, J.I., L.M. Egerton-Warburton, and M.F. Allen. 2009. Topographic position modulates the mycorrhizal response of oak trees to inter-annual rainfall variability in a California woodland. *Ecology* 90: 649-662.
- Hasselquist, N. and M.F. Allen. 2009. Increasing demands on limited water resources: consequences for two endangered species in Amargosa Valley, USA. *American Journal of Botany* 96: 1-7.
- Celis-Murillo, A., J. Deppe, and M.F. Allen. 2009. Using soundscape recordings to estimate species abundance, richness, and composition. *Journal of Field Ornithology* 80: 64-78.
- Barrows, C.W., E.B. Allen, M.L. Brooks and M.F. Allen. 2009. Effects of an invasive plant on a desert sand dune landscape. *Biological Invasions* 11: 673-686.
- Barrows, C.W. and M.F. Allen. 2009. Conserving species in fragmented habitats: Population dynamics of the flat-tailed horned lizard, *Phrynosoma mcallii*. *Southwest Naturalist* 54: 307-316.
- Barrows, C. W. and M. F. Allen. 2009. Conservation implications of fragmentation in desert ecosystems. Pp. 211-220. In R.H. Webb, L.F. Fenstermaker, J.S. Heaton, D.L. Hughson, E.V. McDonand, and D.M. Miller (eds.) *The Mohave Desert : Ecosystem Processes and Sustainability*. University of Nevada Press, Reno NV.
- Jiménez-Osornio, J.J., V. M. Rorive, A. Gomez-Pompa, H. Tiessen, and M.F. Allen. 2009. Thinking outside the box: Tropical conservation in both protected areas and the surrounding matrix. Pp 134-140, in: *Applying Ecological Knowledge to Landuse Decisions*, Edited by Holm Tiessen and John W. B. Stewart. 2009. Proceedings of the international workshop held in Costa Rica by the IAI, SCOPE and IICA.

http://www.iai.int/index.php?option=com_content&view=article&id=24:scientific-publications&catid=24:scientific-publications&Itemid=38

- Halama, K.J., A.J. Malisch, M. Aspell, J.T. Rotenberry and M.F. Allen. 2008. Modeling the landscape niche characteristics of red diamond rattlesnakes (*Crotalus ruber*): Implications for biology and conservation. In W.K. Hayes, K.R. Beaman, M.D. Cardwell and S.P. Bush (eds), pp 463-472, *The Biology of Rattlesnakes*. Loma Linda University Press, Loma Linda, California.
- Allen, M.F. 2008. Water relations in the mycorrhizosphere. *Progress in Botany* 70: 257-276.
- Goode, L. K., and M.F. Allen. 2008. The impacts of Hurricane Wilma on the epiphytes of El Eden Ecological Reserve, Quintana Roo, Mexico. *Journal of the Torrey Botanical Club* 135: 377-387.
- Preston, K.L., J.T. Rotenberry, R.A. Redak, and M.F. Allen. 2008. Habitat shifts of endangered species under altered climate conditions: importance of biotic interactions. *Global Change Biology* 14: 2501-2515.
- Barrows, C.W., K.L. Preston, J.T. Rotenberry, and M.F. Allen. 2008. Using occurrence records to model historic distributions and estimate habitat losses for two psammophilic lizards. *Biological Conservation* 141: 1885-1893.
- Vargas, R. and M.F. Allen. 2008. Environmental controls and the influence of vegetation type, fine roots and rhizomorphs on diel and seasonal variation in soil respiration. *New Phytologist* 179: 460-471.
- Vargas, R. and M.F. Allen. 2008. Diel patterns of soil respiration in a tropical forest after Hurricane Wilma. *Journal of Geophysical Research* 11: G03021. 10pgs/
- Vargas, R. and M.F. Allen. 2008. Dynamics of fine root, fungal rhizomorphs and soil respiration in a mixed temperate forest: Integrating sensors and observations. *Vadose Zone Journal* 7: 1055-1064.
- Vargas, R., M.F. Allen, and E.B. Allen. 2008. Biomass and carbon accumulation in a fire chronosequence of a seasonally dry tropical forest. *Global Change Biology* 14: 109-124.
- Egerton-Warburton, L.M., J.I. Querejeta and M.F. Allen. 2008. Efflux of hydraulically lifted water from mycorrhizal fungal hyphae during imposed drought. *Plant Signaling and Behavior* 3: 68-71.
- Allen, M.F., R. Vargas, E. Graham, W Swenson, M. Hamilton, M. Taggart, T.C. Harmon, A Rat'ko, P Rundel, B. Fulkerson, and D. Estrin. 2007. Soil sensor technology: Life within a pixel. *BioScience* 57: 859-867.
- Querejeta, J.I., M.F. Allen, M.M. Alguacil, and A. Roldan. 2007. Plant isotopic composition provides insight into mechanisms underlying growth stimulation by AM fungi in a semiarid environment. *Functional Plant Biology* 34: 683-691.
- Barrows, C.W. and M.F. Allen. 2007. Persistence and local extinctions of endangered lizard *Uma inornata* on isolated habitat patches. *Endangered Species Research* 3: 61-88.
- Barrows, C.W. and M.F. Allen. 2007. Biological monitoring and bridging the gap between land management and science. *Natural Areas Journal* 27: 194- 197.
- Zimmer, K., M.A Hynson, G. Gebauer, E.B. Allen, M.F. Allen, and D.J. Read. 2007. Wide geographic and ecological distribution of nitrogen and carbon gains from fungi in pyroloids and monotropoids (*Ericaceae*) in orchids. *New Phytologist* 175: 166-175
- Egerton-Warburton, L.M., J.I. Querejeta, and M.F. Allen. 2007. Common mycorrhizal networks provide a potential pathway for the transfer of hydraulically lifted water between plants. *Journal of Experimental Botany* 58: 1473- 1483.

- Allen, M.F. 2007. Mycorrhizal fungi: highways for water and nutrients in arid soils. *Vadose Zone Journal* 6: 291-297.
- Surilnik, A.G., E.B. Allen, T. Meixner, M.E. Fenn, and M.F. Allen. 2007. Changes in N cycling and microbial N with elevated N in exotic annual grasslands of southern California. *Applied Soil Ecology* 36: 1-9.
- Barrows, C.W. and M.F. Allen. 2007. Community complexity: stratifying monitoring schemes within a desert sand dune landscape. *Journal of Arid Environments* 69: 315-330.
- Hamilton, M., E.A. Graham, P.W. Rundel, M.F. Allen, W. Kaiser, M.H. Hansen, and D.L. Estrin. 2007. New approaches in embedded networked sensing for terrestrial ecological observatories. *Environmental Engineering Science* 24: 192-204.
- Querejeta, J.I. H. Estrada-Medina, M.F. Allen, and J.J. Jimenez-Osornio. 2007. Water source partitioning among trees growing on shallow karst soils in a seasonally dry tropical climate. *Oecologia* 152: 26-36.
- Querejeta, J.I., L.M. Egerton-Warburton, and M.F. Allen. 2007. Hydraulic lift may buffer rhizosphere hyphae against the negative effects of severe soil drying in a California oak savanna. *Soil Biology and Biochemistry* 39: 409-417.
- Sirulnik, A.G., E.B. Allen, T. Meixner, and M.F. Allen. 2007. Impacts of anthropogenic N additions on nitrogen mineralization from plant litter in exotic annual grasslands. *Soil Biology and Biochemistry* 39: 24-32.
- Querejeta, J.I. H. Estrada-Medina, M.F. Allen, J.J. Jimenez-Osornio, and R. Ruenes. 2006. Utilization of bedrock water by *Brosimum alicastrum* trees growing on shallow soil atop limestone in a dry tropical climate. *Plant and Soil* 287: 187-197.
- Chen, X., B. -L. Li, T. Scott, and M.F. Allen. 2006. Tolerance analysis of habitat loss for multispecies conservation in western Riverside County, California, USA. *International Journal of Biodiversity Science and Management* 2: 87-96.
- Querejeta, J.I., M.F. Allen, F. Caravaca, and A. Roldan. 2006. Differential modulation of host plant $d^{13}C$ and $d^{18}O$ by native and non-native arbuscular mycorrhizal fungi in a semiarid environment. *New Phytologist* 169: 379-387.
- Barrows, C.W., M.F. Allen and J.T. Rotenberry. 2006. Boundary processes between a desert sand dune community and an encroaching suburban landscape. *Biological Conservation* 131: 486-494.
- Scott, T.A., L. Fernandez, and M.F. Allen. 2006. Land Use Planning and the Endangered Species Act, p. 318-332, in Goble, D.D., Scott, J.M., and Davis, F.W. (eds), *The Endangered Species Act at Thirty: Renewing the Conservation Promise, Volume II*. Island Press, Washington, DC.
- Allen, M.F. 2006. Water dynamics of mycorrhizas in arid soils. In: *Fungi in biogeochemical cycles*. G.M. Gadd, editor, pp 74-97. Cambridge University Press.
- Allen, M.F., J.N. Klironomos, K.K. Treseder, and W.C. Oechel. 2005. Responses of soil biota to elevated CO_2 in a chaparral ecosystem. *Ecological Applications* 15: 1701-1711.
- Klironomos, J.N., M.F. Allen, M.C. Rillig, J. Piotrowski, S. Makvandi-Nejad, B.E. Wolfe, and J.R. Powell. 2005. Abrupt rise in atmospheric CO_2 overestimates community response in a model plant-soil system. *Nature (London)* 433: 621-624.
- Allen, M.F., E.B. Allen and A. Gomez-Pompa. 2005. Effects of mycorrhizae and nontarget organisms on restoration of seasonal tropical forest in Quintana Roo, Mexico: factors limiting tree establishment. *Restoration Ecology* 13: 325-333.

- Chen, X., B-L. Li, T.A. Scott, T. Tennant, J.T. Rotenberry, and M.F. Allen. 2005. Spatial structure of multispecies distributions in southern California, USA. *Biological Conservation* 124: 169-175.
- Barrows, C.W., M.B. Swartz, W.L. Hodges, M.F. Allen, J.T. Rotenberry, and B-L. Li. 2005. A framework for monitoring multiple species conservation plans. *Journal of Wildlife Management* 69: 1333-1345.
- Treseder, K.K., M.F. Allen, R.W. Ruess, K.S. Pregitzer, and R.L. Hendrick. 2005. Lifespans of fungal rhizomorphs under nitrogen fertilization in a pinyon-juniper woodland. *Plant and Soil* 270: 249-255.
- Corkidi, L. E.B. Allen, D. Merhaut, M.F. Allen, J. Downer, J. Bohn, and M. Evans. 2005. Effectiveness of commercial mycorrhizal inoculants on the growth of *Liquidambar styraciflua* in plant nursery conditions. *Journal of Environmental Horticulture* 23: 72-76.
- Allen, M.F., C. Crisifulli, S. Morris, L. Egerton-Warburton, J.A. MacMahon, and J. Trappe. 2005. Mycorrhizae and Mount St. Helens: Story of a symbiosis. Pp. 221-231 In: *Ecological Responses to the 1980 Eruptions of Mount St. Helens*. Dale, V.H., Swanson, F.J. and C.M. Crisafulli (eds.). Springer-Verlag, New York.
- Bornyasz, M.A. R. Graham, and M.F. Allen. 2005. Ectomycorrhizae in a soil-weathered granitic bedrock regolith: linking matrix resources to plants. *Geoderma* 126: 141-160.
- Treseder, K. K., S. J. Morris, and M. F. Allen. 2005, The contribution of root exudates, symbionts, and detritus to carbon sequestration in the soil. *In: Roots and soil management-- Interactions between roots and soil*. pp 145-162S. F. Wright and R. Zobel, eds. *Agronomy Monograph No 48*. American Agronomy Society, Madison WI.
- Allen, M.F., L. Egerton-Warburton, K. Treseder, C. Cario, A. Lindahl, J. Lansing, I. Querejeta, O. Karen, S. Harney and T. Zink. 2005. Biodiversity and mycorrhizal fungi in southern California. In: B. Kus, and J. L. Beyers, *Planning for Biodiversity: Bringing research and management together: Proceedings of a Symposium for the South Coast Ecoregion, March 2000, Pomona, CA*. USDA Forest Service Pacific Southwest Research Station General Technical Report PSW-GTR-195.
- Corkidi, L., E.B. Allen, D. Merhaut, M.F. Allen, J. Downer, J. Bohn, and M. Evans. 2004. Assessing the infectivity of commercial mycorrhizal inoculants in plant nursery conditions. *Journal of Environmental Horticulture* 22(3): 149-154.
- Egerton-Warburton, L., J.I. Querejeta, M.F. Allen and S.L. Finkelman. 2004. Mycorrhizal Fungi. In: *Encyclopedia of Soils in the Environment*. Elsevier, NY.
- Redeker, K.R., K.K. Treseder, and M.F. Allen. 2004. Ectomycorrhizal fungi: A new source of atmospheric methyl halides? *Global Change Biology* 10: 1009-1016.
- Treseder, K.K., C.A. Masiello, J.L. Lansing, and M.F. Allen. 2004. Species-specific measurements of ectomycorrhizal turnover under N-fertilization: Combining isotopic and genetic approaches. *Oecologia* 138: 419-425.
- Renker C, Zobel M, Öpik M, Allen MF, Allen EB, Vosátka M, Rydlová J, Buscot F. 2004. Structure, dynamics and restoration of plant communities: does arbuscular mycorrhiza matter? In: Temperton V, Nuttle T, Hobbs R, Halle S (eds): *Assembly rules and restoration ecology ^ bridging the gap between theory and practice*. Island Press.
- Ruess, R.W., R.L. Hendrick, A.J. Burton, K.S. Pregitzer, B. Sveinbjornsson, M.F. Allen and G. Maurer. 2003. Coupling fine root dynamics with ecosystem carbon cycling in black spruce forests of interior Alaska. *Ecological Monographs* 73: 643-662.

- Allen, M.F., W. Swenson, J.I. Querejeta, L.M. Egerton-Warburton, and K.K. Treseder. 2003. Ecology of mycorrhizae: A conceptual framework for complex interactions among plants and fungi. *Annual Review of Phytopathology* 41: 271-303.
- Allen, E.B., M.F. Allen, L. Egerton-Warburton, L. Corkidi, and A. Gomez-Pompa. 2003. Impacts of early- and late-seral mycorrhizae during restoration in seasonal tropical forest, Mexico. *Ecological Applications* 13: 1701-1717.
- Querejeta, J.I., J.M. Barea, M.F. Allen, F. Caravaca, and A. Roldan. 2003. Differential response of $d^{13}C$ and water use efficiency to arbuscular mycorrhizal infection in two aridland woody plant species. *Oecologia* 135: 510-515.
- Treseder, K.K., L.M. Egerton-Warburton, M.F. Allen, Y. Cheng, and W.C. Oechel. 2003. Alteration of soil carbon pools and communities of mycorrhizal fungi in chaparral exposed to elevated CO_2 . *Ecosystems* 6: 786-796.
- Crocker, T.L., R. L. Hendrick, R. Ruess, K. S. Pregitzer, A. J. Burton, M. F. Allen, J. Shan and L. A. Morris. 2003. Substituting root numbers for length: Improving the use of minirhizotrons to study fine root dynamics. *Applied Soil Ecology* 23: 127-135.
- Querejeta, J. I., L. Egerton-Warburton and M. F. Allen. 2003. Direct nocturnal water transfer from oaks to their mycorrhizal symbionts during severe soil drying. *Oecologia* 134: 55-64.
- Burger, J.C., R.A. Redak, E.B. Allen, J.T. Rotenberry, and M.F. Allen. 2003. Restoring arthropod communities in coastal sage scrub. *Conservation Biology* 17: 460-467.
- Allen, M.F. A. Gomez-Pompa, S. Fedick, and J.J. Jimenez-Osornio. 2003. The Lowland Maya: A case study for the Future? Conclusions. Pp 623-634, in: Gomez-Pompa, A., M.F. Allen, S. Fedick, and J.J. Jimenez-Osornio. *Lowland Maya Area: Three millennia at the human-wildland interface*. Haworth Press, N.Y.
- Allen, E.B., H.A. Violi, M.F. Allen and A. Gomez-Pompa. 2003. Restoration of tropical seasonal forest in Quintana Roo. Pp 587-598. In: Gomez-Pompa, A., M.F. Allen, S. Fedick, and J.J. Jimenez-Osornio. *Lowland Maya Area: Three millennia at the human-wildland interface*. Haworth Press, N.Y.
- Allen, M.F. and E. Rincon. 2003. The changing global environment and the Lowland Maya: past patterns and current dynamics. Pp 13-30 in: Gomez-Pompa, A., M.F. Allen, S. Fedick, and J.J. Jimenez-Osornio. *Lowland Maya Area: Three millennia at the human-wildland interface*. Haworth Press, N.Y.
- Treseder, K. K. and M. F. Allen. 2002. Direct N and P limitation of arbuscular mycorrhizal fungi: a model and field test. *New Phytologist* 155: 507-515.
- Burton, A.J., K.S. Pregitzer, R.W. Ruess, R.L. Hendrick, and M.F. Allen. 2002. Root respiration in North American forests: effects of nitrogen concentration and temperature across biomes. *Oecologia* 131: 559-568.
- Pregitzer, K.S., J.L. DeForest, A.J. Burton, M.F. Allen, R.W. Ruess, and R.L. Hendrick. 2002. Fine root length, diameter, specific root length and nitrogen concentrations of nine tree species across four North American Biomes. *Ecological Monographs* 72: 293-309.
- Allen, M.F., J. Lansing, and E.B. Allen. 2002. The role of mycorrhizal fungi in composition and dynamics of plant communities: A scaling issue. *Progress in Botany* 63:344-367.
- Rillig, M.C., K.K. Treseder and M.F. Allen. 2002. Global change and mycorrhizal fungi. In M.van der Heijden and I. Sanders. *Mycorrhizal Ecology*. Springer-Verlag, NY.
- Allen, M.F. 2002. Mycorrhizae: Arbuscular mycorrhizae. Pp. 2120-2124, In: *Encyclopedia of Environmental Microbiology*. John Wiley & Sons.

- Egerton-Warburton, L.M., E.B. Allen and M.F. Allen. 2002. Mycorrhizal fungal communities: their organization, role and conservation in ecosystems under elevated atmospheric CO₂ and anthropogenic nitrogen deposition. Pp. 19-43. In: K. Sivasithamparan, K.W. Dixon, and R.L. Barrett (eds). *Microorganisms in Plant Conservation and Biodiversity*. Kluwer Academic Press.
- Allen, M.F. D.A. Jasper, and J.C. Zak. 2002. Chapter 14. Micro-organisms. Pp 257-278. In A.J. Davy and M. Perrow. *Handbook of Ecological Restoration Volume 1. Principles of restoration, Part 4. Manipulation of the biota*. Cambridge University Press.
- Egerton-Warburton, L.M., R.C. Graham, E.B. Allen, and M.F. Allen. 2001. Reconstruction of historical changes in mycorrhizal fungal communities under anthropogenic nitrogen deposition. *Proceedings of the Royal Society of London, Series B*. 268: 2479-2484.
- Allen, M.F. 2001. Modeling arbuscular mycorrhizal infection: is % infection an appropriate variable? *Mycorrhiza* 10:255-258.
- Egerton-Warburton, L.M. and M.F. Allen. 2001. Endo- and ectomycorrhizae in *Quercus agrifolia* Nee. (Fagaceae): patterns of root colonization and effects on seedling growth. *Mycorrhiza* 11: 283-290.
- Allen, E.B., J.S. Brown and M.F. Allen. 2001. Restoration of animal, plant, and microbial diversity. In: *Encyclopedia of Biodiversity*, volume 5. S. Levin, ed. Academic Press, San Diego. Pp 185-202.
- Bainbridge, D, J. Tizler, R. MacAller, and M.F. Allen. 2001. Irrigation and mulch effects on desert shrub transplant establishment. *Native Plants Journal* 2: 25-29.
- Treseder, K.K. and M.F. Allen. 2000. Black boxes and missing sinks: Fungi in global change research. *Mycological Research* 104: 1282-1283.
- Allen, M.F. 2000. Book Review: *Repairing damaged wildlands: a process-oriented, landscape-scale approach*. *Agricultural and Forest Meteorology*.
- Treseder, K.K. and M.F. Allen. 2000. Mycorrhizal fungi have a potential role in soil carbon storage under elevated CO₂ and nitrogen deposition. *New Phytologist* 147: 189-200.
- Allen, E.B., S. A. Eliason, V. J. Marquez, G. P. Schultz, N. K. Storms, C. D. Styliniski, T. A. Zink, and M. F. Allen. 2000. What are the limits to restoration of coastal sage scrub in southern California? Pages 253-262 in J.E. Keeley, M.B. Keeley and C.J. Fotheringham, eds. *2nd Interface Between Ecology and Land Development in California*. USGS Open-File Report 00-62, Sacramento, California.
- Allen, M.F. 2000. Book Review: *Current advances in mycorrhizae research*. *Mycological Research* 104: 1535-1536.
- Edwards, F.S., D.A. Bainbridge, T.A. Zink and M.F. Allen. 2000. Rainfall catchments improve survival of container transplants at a Mojave Desert site. *Ecological Restoration* 18: 100-103.
- Allen, M.F. 2000. Mycorrhizae. in M. Alexander (ed.). *Encyclopedia of Microbiology*, 2nd edition. Pp 328-336. Academic Press, San Diego.
- Rillig, M.C., S.F. Wright, M.F. Allen and C.B. Field. 1999. Rise in carbon dioxide changes soil structure. *Nature* 400: 628.
- Rillig, M.C., C.B. Field, and M.F. Allen. 1999. Soil biota responses to long-term atmospheric CO₂ enrichment in two California annual grasslands. *Oecologia* 119: 572-577.
- Klironomos, J.N., M.C. Rillig, and M.F. Allen. 1999. Designing belowground field experiments with the help of semi-variance and power analyses. *Applied Soil Ecology* 12: 227-238.

- Rillig, M.C. and M.F. Allen. 1999. What is the role of arbuscular mycorrhizal fungi in plant to ecosystem responses to elevated atmospheric CO₂? *Mycorrhiza* 9: 1-8.
- Allen, M.F., L.M. Egerton-Warburton, E.B. Allen and O. Karen. 1999. Mycorrhizae in *Adenostoma fasciculatum* Hook. & Arn.: a combination of unusual ecto- and endo-forms. *Mycorrhiza* 8: 225-228.
- Allen, M.F., J.M. Trappe, and T.R. Horton. 1999. NATS Truffle and truffle-like fungi 8: *Rhizopogon menzei* sp. nov. (Boletaceae, Basidiomycota). *Mycotaxon* 70:149-152.
- Rillig, M.C., C.B. Field and M.F. Allen. 1999. Fungal root colonization responses in natural grasslands after long-term exposure to elevated atmospheric CO₂. *Global Change Biology* 5: 577-585.
- Allen M.F. et al. 1999. Soil Microorganisms, cpt 22, pp521-544. In L. Walker (ed.) *Ecosystems of disturbed ground*. 16. *Ecosystems of Disturbed Ground*. Elsevier Press, New York.
- Klironomos, J.N., M. Ursic, M. Rillig and M.F. Allen. 1998. Interspecific differences in the response of arbuscular mycorrhizal fungi to *Artemisia tridentata* grown under elevated atmospheric CO₂. *New Phytologist* 138: 599-605
- Rillig, M.C., and M.F. Allen. 1998. Arbuscular mycorrhizae of *Gutierrezia sarothrae* and elevated carbon dioxide: evidence for shifts in C allocation to and within the mycobiont. *Soil Biology and Biochemistry* 30: 2001-2008.
- Allen, E.B., E. Rincon, M.F. Allen, A. Pérez-Jimenez, and P. Huante. 1998. Disturbance and Seasonal Dynamics of Mycorrhizae in a Tropical Deciduous Forest in Mexico. *Biotropica* 30:261-274.
- Zink, T.A. and M.F. Allen. 1998. The effects of organic amendment on the restoration of a disturbed coast sage scrub habitat. *Restoration Ecology* 6: 52-58.
- Rillig, M.C., M.F. Allen, J.N. Klironomos, N.R. Chiariello, and C.B. Field. 1998. Plant-species specific changes in root-inhabiting fungi in a California annual grassland: responses to elevated CO₂ and nutrients. *Oecologia* 113: 252-259.
- Rillig, M.C., M.F. Allen, J.N. Klironomos, and C.B. Field. 1998. Arbuscular mycorrhizal percent root infection and infection intensity of *Bromus hordeaceus* grown in elevated atmospheric CO₂. *Mycologia* 90: 199-205.
- Klironomos, J.N., M.C. Rillig, M.F. Allen, D.R. Zak, K.S. Pregitzer, M.E. Kubiske. 1997. Increased levels of airborne fungal spores in response to *Populus tremuloides* grown under elevated atmospheric CO₂. *Canadian Journal of Botany* 75: 1670-1673.
- Morris, S.J., T. Zink, K. Connors, and M.F. Allen. 1997. Comparison between fluorescein diacetate and differential fluorescent staining procedures for determining fungal biomass in soils. *Applied Soil Ecology* 6: 161-167.
- Klironomos, J.N., M.C. Rillig, M.F. Allen, D.R. Zak, M. Kubiske and K.S. Pregitzer. 1997. Soil fungal-arthropod responses to *Populus tremuloides* grown under enriched atmospheric CO₂ under field conditions. *Global Change Biology* 3: 473-478.
- Harney, S.L., F. Edwards, and M.F. Allen. 1997. Identification of arbuscular mycorrhizal fungi from *Artemisia californica* using the polymerase chain reaction. *Mycologia*. 89: 547-550.
- Rillig, M.C., K.M. Scow, J.N. Klironomos and M.F. Allen. 1997. Microbial carbon-substrate utilization in the rhizosphere of *Gutierrezia sarothrae* grown in elevated atmospheric carbon dioxide. *Soil Biology and Biochemistry*, 29: 1387-1394.

- Allen, M.F., J. Klironomos, and S. Harney. 1997. The Epidemiology of Mycorrhizal Fungi During Succession In: G. Carroll and P. Tudzynski (eds), *The Mycota* vol VB. pp 169-183.
- Friese, C.F., S.J. Morris and M.F. Allen. 1997. Disturbance in natural ecosystems: scaling from fungal diversity to ecosystem functioning. In: D.T. Wicklow and B. Soderstrom, eds. *The Mycota- Vol IV. Environmental and microbial relationships*. pp 47-63.
- Klironomos, J.N. Rillig, M.C. and Allen, M.F. 1996. Below-ground microbial and microfaunal responses to *Artemisia tridentata* grown under elevated atmospheric CO₂. *Functional Ecology* 10: 527-534.
- Weinbaum, B.S., M.F. Allen and E.B. Allen. 1996. Survival of arbuscular mycorrhizal fungi following reciprocal transplanting across the Great Basin, U.S.A. *Ecological Applications* 6: 1365-1372.
- Allen, M.F. 1996. The role of restoration ecology in ecosystem management: opportunities and responsibilities. pp.11-14. In D. Peterson, *The role of restoration in ecosystem management: Society for Ecological Restoration, Parks Canada*.
- Allen, M.F. 1996. The ecology of arbuscular mycorrhizae: A look back into the 20th century and a peek into the 21st. Centenary Review Article, British Mycological Society. *Mycological Research* 100: 769-782.
- Allen, M.F. C. Figueroa, B.S. Weinbaum, S.B. Barlow, and E.B. Allen. 1996. Differential production of oxalates by mycorrhizal fungi in arid ecosystems. *Biology and Fertility of Soils* 22: 287-292.
- Klironomos, J.N. and M.F. Allen. 1995. UV-B-mediated changes on below-ground communities associated with the roots of *Acer saccharum*. *Functional Ecology* 9: 923-930.
- Zink, T.A., M.F. Allen, B. Heindle-Tenhunen, and E.B. Allen. 1995. The effects of a disturbance corridor on an ecological reserve. *Restoration Ecology* 3: 304-310.
- Zink, T.A. and M.F. Allen. 1995. Disturbance corridors as invasion pathways. *Restoration and Management Notes* 13: 132-133.
- Cannon, J.P., E.B. Allen, M.F. Allen, L.M. Dudley and J.J. Jurinak. 1995. The effects of oxalates produced by *Salsola tragus* on the phosphorus nutrition of *Stipa pulchra*. *Oecologia (Berlin)* 102: 265-272.
- Allen, M.F., S.J. Morris, F. Edwards, and E.B. Allen. 1995. Microbe-plant interactions in Mediterranean-type habitats: shifts in fungal symbiotic and saprophytic functioning in response to global change. pp. 287-305. In: J.M. Moreno and W.C. Oechel. *Global change and Mediterranean-type ecosystems. Ecological Studies* 117. Springer Verlag-New York.
- Allen, E.B., M.F. Allen D.J. Helm, J.M. Trappe, R. Molina and E. Rincon. 1995. Patterns and regulation of arbuscular and ectomycorrhizal plant and fungal diversity. *Plant and Soil* 170: 47-62.
- Morris, S.J. and M.F. Allen. 1994. Oxalate metabolizing microorganisms in sagebrush steppe soils. *Biology and Fertility of Soils* 18: 255-259.
- Klopatek, C.C., Friese, C.F., Allen, M.F., Klopatek, J.M., 1994. Comparisons of laboratory and field burning experiments on mycorrhizae distribution, density and diversity. *J. Soc. Am. For. (Twelfth Conference on Fire and Forest Mineralogy, Special. Issue)* 94: 762-776.

- Conners, K., S. Morris, T. Zink, D. Bainbridge, and M.F. Allen. 1994. Europium staining for Soil Ecosystems Disturbance Evaluation (California). *Restoration and Management Notes* 12: 211-212.
- Allen, M.F., E.B. Allen, C.N. Dahm, and F.S. Edwards. 1993. Preservation of biological diversity in mycorrhizal fungi: Importance and human impacts. In: G. Sundnes, ed. *International Symposium on human impacts on self-recruiting populations*. The Royal Norwegian Academy of Sciences, Trondheim, Norway. pp 81-108.
- Allen, M.F. 1993. Microbial and phosphate dynamics in a restored shrub steppe in Southwestern Wyoming. *Restoration Ecology* 1: 196-205.
- Allen, E.B., J.P. Cannon and M.F. Allen. 1993. Controls for rhizosphere microorganisms to study effects of VA mycorrhizae on *Artemisia tridentata*. *Mycorrhiza* 2: 147-152.
- Friese, C.F. and M.F. Allen. 1993. The interaction of harvester ants and VA mycorrhizal fungi in a patchy environment: the effects of mound structure on fungal dispersion and establishment. *Functional Ecology* 7: 13-20.
- Allen, M.F., E. Rincon, E. B. Allen, P. Huante, and J. Dunn. 1993. Observations of canopy bromeliad roots compared with plants rooted in soils of a seasonal tropical forest, Chamela, Jalisco, Mexico. *Mycorrhiza* 4: 27-28.
- Allen, M.F. and E.B. Allen. 1992. Development of mycorrhizal patches in a successional arid ecosystem. In: I.J. Alexander, A.H. Fitter, D.H. Lewis, and D.J. Read (eds). *Mycorrhiza in Ecosystems, Proceedings of the 3rd European Symposium on Mycorrhizas*. CAB International. pp 164-170.
- Friese, C.F., M.F. Allen, R. Martin, & N.K. Van Alfen. 1992. Transfer of double stranded RNA among isolates of *Cryphonectria parasitica*: Hyphal specialization on an artificial medium. *Applied and Environmental Microbiology* 58: 2066-2070.
- Allen, M.F., C. Crisafulli, C.F. Friese, and S. Jeakins. 1992. Reformation of mycorrhizal symbioses on Mount St. Helens, 1980-1990: Interactions of rodents and mycorrhizal fungi. *Mycological Research* 96: 447-453.
- Allen, M.F., S.D. Clouse, B.S. Weinbaum, S.L. Jeakins, C.F. Friese, and E.B. Allen. 1992. Mycorrhizae and the integration of scales: from molecules to ecosystems. In: *Mycorrhizal Functioning*. Ed M.F. Allen. Chapman and Hall Press, N.Y. pp. 488-515.
- Allen, M.F. and C.F. Friese. 1992. Mycorrhizae and Reclamation Success: Importance and Measurement. In: *Evaluating reclamation success: The ecological considerations*. Ed J.C. Chambers & G.L. Wade. USDA Forest Service General Technical Report. pp 17-25.
- Allen, M.F. and E.B. Allen. 1992. Mycorrhizae and plant community development: Mechanisms and patterns. In: G.C. Carroll and D.T. Wicklow, eds. *The Fungal Community*, Marcel Dekker, Inc. New York. pp 455-479.
- Friese, C.F. and M.F. Allen. 1991. The spread of VA mycorrhizal fungal hyphae in the soil: inoculum types and external hyphal architecture. *Mycologia* 83:409-418.
- Klopatek, C.C., C. Friese, M.F. Allen, L.F. DeBano, and J.M. Klopatek. 1991. The effect of a high intensity fire on the patch dynamics of VA mycorrhizae in a pinyon-juniper woodlands. pp. 123-128, in: Nodvin, S.C., Waldrop, A. eds. 1991. *Fire and the environment: ecological and cultural perspectives: Proceedings of an international symposium; 1990 March 20-24; Knoxville, TN*. Gen Tech Rep. SE-69. Asheville, NC: USDA Forest Service, Southeastern Forest Experiment Station 429 pp.
- Allen, M.F. and E.B. Allen. 1990. Carbon source of VA mycorrhizal fungi associated with Chenopodiaceae from a semi-arid steppe. *Ecology* 71: 2019-2021.

- Friese, C.F. and M.F. Allen. 1990. Tracking the fates of exotic and local VA mycorrhizal fungi: Methods and Patterns. *Agriculture, Ecosystems and Environment* 34: 87-96.
- Allen, E.B. and M.F. Allen. 1990. The mediation of competition by mycorrhizae in successional and patchy environments. Pages 367-389. In: *Perspectives on Plant Competition*. J.B. Grace & G.D. Tilman, ed. Academic Press.
- Allen, M.F., J.H. Richards and C.A. Busso. 1989. Influence of clipping and water status on vesicular-arbuscular mycorrhizae of two semiarid tussock grasses. *Biology and Fertility of Soils*, 8: 285-289.
- Allen, M.F. E.B. Allen and C.F. Friese. 1989. Responses of the non-mycotrophic plant *Salsola kali* to invasion by VA mycorrhizal fungi. *New Phytologist* 111: 45-49.
- Allen, M.F. 1989. Mycorrhizae and rehabilitation of disturbed arid soils: processes and practices. *Arid Soil Research* 3: 229-241.
- Allen, M.F., L.E. Higgs, and G.E. Wooldridge. 1989. Wind dispersal and subsequent establishment of vesicular-arbuscular mycorrhizal fungi across a disturbed arid landscape. *Landscape Ecology* 2: 165-171.
- Knight, W.G., M.F. Allen, J.J. Jurinak and L.M. Dudley. 1989. Elevated carbon dioxide and solution phosphorus in soil with vesicular-arbuscular mycorrhizal western wheatgrass. *Soil Science Society of America Journal* 53: 1075-1082.
- Allen, M.F. 1988. Physiological Ecology of the Mycorrhizal-Root Interface: From Cellular to Organismal Effects and Plant Responses. *Proceedings of the 1988 California Plant and Soil Conference, Agriculture: Changing Realities*. pp. 16-20. California Chapter of the American Society of Agronomy.
- Allen, M.F. & J.A. MacMahon. 1988. Direct VA mycorrhizal inoculation of colonizing plants by pocket gophers (*Thomomys talpoides*) on Mount St. Helens. *Mycologia* 80:754-756..
- Allen, M.F. 1988. Viewpoint #1. *Reclamation Newsletter* 11(1):7-8.
- Allen, M.F. 1988. Re-establishment of mycorrhizae following severe disturbance: comparative patch dynamics of a shrub desert and a subalpine volcano. *Proceedings of the Royal Society of Edinburgh* 94 B: 63-71.
- Carpenter, A. and M.F. Allen. 1988. Responses of *Hedysarum boreale* Nutt. to mycorrhizas and Rhizobium: plant and soil nutrient changes in a disturbed shrub-steppe. *New Phytologist* 109: 125-132.
- Allen, M.F. 1988. Belowground spatial patterning: influence of root architecture, microorganisms, and nutrients on plant survival in arid lands. Pages 113-135, In: *The reconstruction of disturbed arid ecosystems*. E.B. Allen, ed. Westview Press, Boulder, CO.
- Allen, E.B. & M.F. Allen. 1988. Facilitation of succession by the non-mycotrophic colonizer *Salsola kali* (Chenopodiaceae) on a harsh site: Effects of mycorrhizal fungi. *American Journal of Botany* 75:257-266.
- Higgs, L.E. & M.F. Allen. 1987. The distortion of turbulence by an isolated shrub, and association with entrainment and deposition of spores. pp. 275-276. In 18th Conference of Agricultural and Forest Meteorology and 8th Conference on Biometeorology and Aerobiology. American Meteorological Society, Boston.
- Allen, M.F., E.B. Allen, & N.E. West. 1987. Influence of parasitic and mutualistic fungi on *Artemisia tridentata* during high precipitation years. *Bulletin of the Torrey Botanical Club* 114:272-279.

- Allen, M.F. 1987. Ecology of vesicular-arbuscular mycorrhizae in an arid ecosystem: use of natural processes promoting dispersal and establishment. pp. 133-135. In: D.M. Sylvia, L.L. Hung and J.H. Graham. Mycorrhizae in the next decade, practical applications and research priorities. IFAS, University of Florida, Gainesville, FL.
- Warner, N.J., M.F. Allen, & J.A. MacMahon. 1987. Dispersal agents of vesicular-arbuscular mycorrhizal fungi in a disturbed arid ecosystem. *Mycologia*. 79:721-730.
- Allen, E.B., J.C. Chambers, K.F. Conner, M.F. Allen, & R.W. Brown. 1987. Natural reestablishment of mycorrhizae in disturbed alpine ecosystems. *Arctic and Alpine Research* 19:11-20.
- Allen, M.F. 1987. Reestablishment of mycorrhizae on Mount St. Helens: migration vectors. *Transactions of the British Mycological Society* 88:413- 417.
- Allen, M.F. & E.B. Allen. 1986. Utah State Project Exemplifies Restoration Ecology Approach to Research. *Restoration and Management Notes* 4(2): 64-67.
- Allen, E.B., & M.F. Allen. 1986. Water relations of xeric grasses in the field: Interactions of mycorrhizae and competition. *New Phytologist* 104:559-571.
- Jurinak, J.J., L.M. Dudley, M.F. Allen & W.G. Knight. 1986. The role of calcium oxalate in the availability of phosphorus in soils of semiarid regions: a thermodynamic study. *Soil Science* 142:255-261.
- Ianson, D.C. & M.F. Allen. 1986. The effects of soil texture on extraction of vesicular-arbuscular mycorrhizal fungal spores from arid sites. *Mycologia* 78: 164-168.
- Skujins, J.J. and M.F. Allen. 1986. Use of mycorrhizae for land rehabilitation. *MIRCEN Journal* 2:161-176.
- Allen, M.F. & L.E. Hips. 1985. Long-distance dispersal of mycorrhizal fungi: A comparison of vectors of VAM and ectomycorrhizal fungi from predictable versus unpredictable environments. pp. 294-295. In 17th Conference on Agricultural and Forest Meteorology and 7th conference on Biometeorology and Aerobiology. American Meteorological Society, Boston.
- Allen, M.F., M.G. Boosalis, E.D. Kerr, A.E. Muldoon, & H.J. Larsen. 1985. Population dynamics of sugar beets, *Rhizoctonia solani* and *Laetisaria arvalis*: Responses of a host, plant parasite and hyperparasite to perturbation in the field. *Applied and Environmental Microbiology* 50:1123-1127.
- Allen, M.F. 1985. Spatial patterning and soil saprophytic microbiota: impacts of strip mining, importance and management strategies. In: Proceedings of the American Society for Surface Mining and Reclamation, symposium on "How microorganisms improve reclamation: their importance and management in mine soils". pp. 322-326.
- Caldwell, M.M., D.M. Eissenstat, J.H. Richards, & M.F. Allen. 1985. Competition for phosphorus: differential uptake from dual-isotope-labeled interspaces between shrub and grass. *Science* 229:384-386.
- Allen, M.F. 1985. Phytohormone action: an integrative approach to understanding diverse mycorrhizal responses. p. 158-160, In R. Molina (ed). Proceedings of the 6th North American Conference on Mycorrhizae. Forestry Sciences Laboratory, Corvallis, OR.
- Allen M.F. & J.A. MacMahon. 1985. Impact of disturbance on cold desert fungi: comparative microscale dispersion patterns. *Pedobiologia* 28:215-224.
- Allen, E.B. & M.F. Allen. 1984. Competition between plants of different successional stages: mycorrhizae as regulators. *Canadian Journal of Botany* 62:2625-2629.

- Allen, M.F., E.B. Allen, & P.D. Stahl. 1984. Differential niche response of *Bouteloua gracilis* and *Pascopyrum smithii* to VA mycorrhizae. *Bulletin of the Torrey Botanical Club* 111:361-365.
- Allen, M.F., J.A. MacMahon, & D.C. Andersen. 1984. Reestablishment of Endogonaceae on Mount St. Helens: Survival of Residuals. *Mycologia* 76:1031-1038.
- Allen, M.F. 1984. Prospects for mycological contribution to mycorrhizology: a promising mutualism. *MSA Newsletter* 35 (2):68-69.
- Allen, M.F. 1984. Physiology of mycorrhizae of arid lands: a key to understanding successful plant establishment. pp. 69-80 In: S.E. Williams & M.F. Allen eds. VA mycorrhizae and reclamation of arid and semiarid lands. University of Wyoming Experiment Station.
- Allen, M.F. 1983. Formation of vesicular-arbuscular mycorrhizae in *Atriplex gardneri* (Chenopodiaceae): seasonal response in a cold desert. *Mycologia* 75:773-776.
- Allen, M.F. & M.G. Boosalis. 1983. Effects of two species of vesicular-arbuscular mycorrhizal fungi on drought tolerance of winter wheat. *New Phytologist* 93:67-76.
- Allen, M.F. 1982. Mushrooms. *Woodsmoke* 11:22-23.
- Allen, M.F., T.S. Moore, Jr., & M. Christensen. 1982. Phytohormone changes in *Bouteloua gracilis* infected by vesicular-arbuscular mycorrhizae: II. Altered levels of gibberellin-like substances and abscisic acid in the host plant. *Canadian Journal of Botany* 60:468-471.
- Allen, M.F. 1982. Influence of vesicular-arbuscular mycorrhizae on water movement through *Bouteloua gracilis*. *New Phytologist* 91:191-196.
- Porter, J.R., M.F. Allen, L.C. Lane, & M.G. Boosalis. 1982. Platte Valley Yellows of Nebraska soybeans. Symptomology and preliminary chemical analyses. *Plant and Soil* 68:283-287.
- Allen, M.F., & T.V. St. John. 1982. Dual culture of endomycorrhizae. pp. 85-89 In: N.C. Schenck, ed. *Methods and principles of mycorrhizal research*. American Phytopathological Society, St. Paul, MN.
- Stanton, N., M.F. Allen & M. Champion. 1981. The effect of the pesticide carbofuran on soil organisms and root and shoot production in shortgrass prairie. *Journal of Applied Ecology* 18:417-431.
- Allen, M.F., W.K. Smith, T.S. Moore, Jr. & M. Christensen. 1981. Comparative water relations and photosynthesis of mycorrhizal and nonmycorrhizal *Bouteloua gracilis* H.B.K. *Lag ex Steud.* *New Phytologist* 88:683-693.
- Allen, M.F., J.C. Sexton, T.S. Moore, Jr., & M. Christensen. 1981. The influence of phosphate source on vesicular-arbuscular mycorrhizae of *Bouteloua gracilis*. *New Phytologist* 87:687-694.
- Allen, E.B. & M.F. Allen. 1980. Natural re-establishment of vesicular-arbuscular mycorrhizae following stripmine reclamation in Wyoming. *Journal of Applied Ecology* 17:139-147.
- Allen, M.F., T.S. Moore, Jr., & M. Christensen. 1980. Phytohormone changes in *Bouteloua gracilis* infected by vesicular-arbuscular mycorrhizae: I. Cytokinin increases in the host plant. *Canadian Journal of Botany* 58:371-374.
- Allen, M.F., T.S. Moore, Jr., M. Christensen, & N. Stanton. 1979. Growth of vesicular-arbuscular-mycorrhizal and nonmycorrhizal *Bouteloua gracilis* in a defined medium. *Mycologia* 71:666-669.

Post-doctoral Associates:

Mia Maltz, 2016-19. Biological control agents of invasive brome grasses.
 Amin Tayyebi, 2015-2016. Remote sensing of vegetation and soil change
 Bridget Hilbig, 2015-16. Biological control of invasive brome grasses.
 Heather Hulton VanTassel, 2015-16. Endangered species modeling and monitoring
 Michael Bell, 2013. Endangered species modeling and monitoring program design.
 Einav Mayzlish-Gati, 2007-2008. Designing technologies to evaluate responses of soil organisms to environmental change.
 Cameron Barrows, 2005-2007. Monitoring of threatened and endangered species.
 Kristine Preston, 2004-2007. Monitoring of threatened and endangered species.
 Kenneth J. Halama, 2003-2005. Monitoring of threatened and endangered species.
 Monica Swartz, 2002-2004. Monitoring of threatened and endangered species
 Petra Prouzova, 2003-2004. Molecular characterization of oak mycorrhizae
 William Swenson, 2002-2006. Complexity of myco-rhizosphere communities.
 Wendy Hodges, 2002-2003. Monitoring of threatened and endangered species.
 Jamie Rotenberg, 2001- 2003. Restoration of tropical seasonal forest.
 José Ignacio Querejeta, 1999-2003. Fulbright Postdoctoral Fellowship (Spain). Water dynamics and restoration and management of Mediterranean-type ecosystems.
 Season Snyder, 2001-2002. Policy Development and Multiple Species Habitat Conservation Planning.
 Kathleen Treseder, 1999-2001. NSF Postdoctoral Fellowship. Mycorrhizal fungi and global change.
 Louise Egerton-Warburton, 1999-2001. Structure and functioning of mycorrhizal fungi.
 Ola Karen, 1998-1999. Biodiversity of soil organisms with global change.
 John Klironomos, 1994-1996. Structure of soil communities under elevated CO₂.
 Sharon Harney, 1995-1997. Biodiversity of soil organisms in elevated CO₂.

Graduate Students:

Sören Weber, M.S. 2017. Responses of arbuscular mycorrhizal fungi to multiple global change drivers in coastal sage scrub. 55 pages.
 Matthew O'Neill, Ph.D. 2017. Eco-evolutionary dynamics of invasion in the exotic grass *Bromus rubens* L.
 Michelle Murphy, M.S. 2011. Evaluating Wildlife Corridor Linkages: Do Freeway Underpasses Connect the Peninsular and Transverse Mountain Ranges?
 Niles Hasselquist, Ph.D. 2009. Mycorrhizae, water and a changing climate: How do trees survive in a seasonally dry tropical forest.
 Laurel Salzman. Ph.D. 2009. Structure and functioning of epiphyte communities in a seasonal tropical forest.
 Ayesha T. Sirajuddin. Ph.D. 2009. Impact of Atmospheric Nitrogen Pollution on Belowground Mycorrhizal Fungal Community Structure and Composition in the San Bernardino Mountains.
 Hector Estrada, Ph.D. 2009. Importance of the subsurface limestone and pockets of soil as sources of water for tree species in Yucatan, Mexico.
 Rodrigo Vargas, Ph.D. 2007. Carbon Dynamics in a Seasonally Dry Tropical Forest.
 Alisha Glass, M.S. (non-thesis). 2007.
 Cameron Barrows, Ph.D. 2006. A framework for monitoring multiple species conservation programs.

- Adam Malisch. MS 2005. Developing and testing predictive distribution models for five lizard species in southern California.
- Sean Askay. MS. 2007. New visualization tools for environmental sensor networks: Using Google Earth as an interface to micro-climate and multimedia datasets..
- Amy Lindahl. MS. 2002. Ecto- and arbuscular mycorrhizal fungi in transplanted oak seedlings in a southern California oak (*Quercus agrifolia*: Fagaceae)- grassland ecosystem.
- Margaret Bornyas. MS, 2003. Distribution of coast live oak woodland mycorrhizae in a soil-weathered bedrock regolith..
- Jennifer Lansing. Ph.D. 2003. Comparing arbuscular and ectomycorrhizal fungal communities in seven North American Forests and their response to nitrogen fertilization.
- Jennifer Campbell. M.S. 2002. Microbial ecology and slender-horned spineflower, an endangered plant species.
- Cara Hinkson Cario. Ph.D. 2005. Elevated atmospheric carbon dioxide and chronic atmospheric nitrogen deposition change nitrogen dynamics associated with two Mediterranean climate evergreen oaks.
- Matthias Rillig. Ph.D. 1997. Influence of elevated CO₂ on mycorrhizae of Mediterranean-type ecosystems.
- Lisa Heffernan. M.S. 1996. Measuring the effects of increased levels of carbon dioxide on soil bacteria in a Mediterranean type ecosystem.
- Fred Edwards, M.S. 1995. Indicators of ecosystem perturbation: Herbaceous plants and arbuscular mycorrhizal fungi.
- James Trent, Ph.D. 1993. Rhizosphere formation and hydraulic lift in Indian ricegrass: Rhizosphere composition and nitrogen fixation.
- Thomas Zink. M.S. 1994. The effect of recalcitrant organic amendments on anthropogenically-disturbed coastal sage and arid shrub ecosystems of Southern California.
- Sherri Morris, M.S. 1992. Degradation of oxalate by microorganisms in a shrub-steppe ecosystem.
- Barbara Weinbaum, M.S. 1993. Tracking the fate of *Acaulospora elegans* and *Scutellospora calospora* transplanted between two distant sagebrush populations.
- Carl Friese, Ph.D. 1991. The establishment of VA mycorrhizal fungi: interaction of root architecture and harvester ant activity.
- Jose Rodriguez G. M.S. 1985. Root observations in revegetated lands: vertical distribution with varying soil layers.

Classes Taught:

UC Riverside

Undergraduate

Introduction to Organismal Biology (5B), Introductory Ecology and Evolution (5C), Ecology and Conservation Biology (116), Conservation Ecology (majors), Organisms in their Environment (biology for undergraduate non-majors) (03): Ecology and Evolution section, undergraduate seminars

Environmental Microbiology (ENSC/MCLB 133).

Graduate

Ecology: From Genes to Ecosystems (EEOB 211), Community and Population Biology (EEOB 117), Ecological Systems in Space and Time (EEOB 212), Field Ecology (EEOB 218), seminars

San Diego State University

Introductory Mycology, Introductory Ecology and Evolution, Seminars

Utah State University

Soil Microbiology, Mycology

International Workshops Taught:

Leaf-cutter ants and biogeochemical processes. La Selva Biological Station, Costa Rica, July 2015. (M. Allen, organizer and instructor).

Yucatán Soil Health and Mycorrhiza Workshop, Universidad Autónoma de Yucatán, April 2015, scaled to Tzucacab Technical High School, Tzucacab, Yucatán, April 2015.

Cordoba Mycorrhiza Workshop. University of Cordoba, Argentina. December 2013. (Organizers, Edith Allen, Laura Dominguez, and Michael Allen).

Organization for Tropical Studies (NSF) PASI Program: Expanding the Frontier in Tropical Ecology through Embedded Sensors, Aug 2010, Sept 2011. La Selva Biological Station <http://www.ots.ac.cr/> (PI P. Rundel, Instructors Harmon, Allen).

Environmental Sensing Technology: State of the Art 2013. An International Workshop. This workshop included researchers from universities, national laboratories, and private companies developing sensing technologies. University of California, Riverside, February 2013.

Soil Ecology Society Workshop: Integrating soil observing and sensor networks in soil ecological studies. SES meeting 2009, Burlington, VT.

RESEARCH ACTIVITIES: GRANTS, CONTRACTS AND ENDOWMENTS:

Crucial Carbon Stores and Fluxes in Desert Environments. Carmen Blackwood, Michael Allen, David Schimel (Co-Leads): CalTech/JPL, 2026 Study Program, Keck Institute for Space Studies. Workshop, 2026-7.

DeepRoot: Automated Root Analysis for Minirhizotrons. DOE SBIR phase 1 award grant DE-SC0020492 to TECH-X. Subcontract to Rhizosystems, LLC. Michael Taggart (PI, Managing Director and CEO) and Michael F. Allen (Director of Science Research). 2/2020.

RAPID: Collaborative Research: ENSO and Tropical Rain Forest Soil Carbon (CH₄, CO₂) Fluxes. NSF Ecosystems Program DEB1624623. \$126,247. PI. M.F. Allen. T.C. Harmon (UC Merced). Co-PI Emma Aronson 3/2016-2/2018.

Collaborative Proposal: Quantifying the footprint of a dominant organism: Biogeochemical impacts of leaf cutter ants in a lowland tropical forest ecosystem. DEB-1442537. \$199,328 (UCR) of \$800,000 (total). 2014-2018. NSF Ecosystems Program.. M.F. Allen, PI. With Tamara Zelakova (University of Wyoming), Thomas Harmon (UC Merced), Steven Oberbauer (Florida International University).

Using UC Reserves to detect and forecast climate impacts. \$2,000,000. UC Research Initiatives. Barry Sinervo, PI. M.F. Allen et al. Co-PI. 1/1/2015-12/31/2018

The role of Environmental Change on the human-wildland interface: The Lowland Maya as a model study system. UC Mexico President's Initiative, Working Group on the Environment. \$30,000. PI M.F. Allen, Co-Investigators E.B. Allen D Jenerette, T. Stanton, and J. Jimenez-Osornio, Hector Estrada Medina (UADY).

Riverside County Habitat Conservation Agency. \$100,000 (2013-2017). UCR-13070768. Biological control of Invasives in SoCal for Restoring Forb/Shrubland Communities. M.F. Allen (PI). E.B. Allen, C.J. McDonald, (Co-PIs).

County of Riverside. and El Sobrante Landfill. Conservation Biology Inland Riverside County. \$1,894,544. 2002 – 2017. M.F. Allen.

MRI: Acquisition of a Big Data Compute Cluster for Interdisciplinary Research. DBI-1429826. \$783,537. NSF. Thomas Girke, PI. M.F. Allen et al. Co-PI.

CC*IIIE Networking Infrastructure: UCR's Science DMZ. ACI-1440543. \$499,893. NSF CC*IIIE 1440543. Michael Pazzini, PI, M.F. Allen et al. Co-PI.

Effect of land use, soil type and agricultural practices on preserving organic soil carbon stocks. CN-14-32, \$25,000. UC MEXUS. M.F. Allen and J. Jimenez-Osornio (PIs), Hector Estrada Medina, Darrel Jenerette, and Edith B. Allen (Co-PIs).

Enhanced Minirhizotron and Image Analysis. Department of Energy. #DE-SC0009677. STTR 2013. Michael Taggart, CEO Rhizosystems LLC, PI. M.F. Allen, Co-PI, PI of UCR subaward. \$155,000 2013, UCR subaward \$45,000.

UC ANR Competitive Research Award. \$50,000 (2011-2013). Understanding and controlling invasions: comparing plant-soil feedbacks of invasive annual grasses in California with their Mediterranean origins. E.B. Allen PI, M.F. Allen, N. Ellstrand Co-PIs.

Carbon balance in deserts: Implications for widespread solar power. California Institute of Energy and Environment. CEC-500-2013-063. \$149,980. (2012-2013). M.F. Allen (PI), Darrel Jenerette, Louis Santiago, Co-PIs.

Center for Embedded Networked Sensing (CENS). \$12,000,000 (2002-2013). National Science Foundation. CCR-01120778. D. Estrin, UCLA (PI), M. Allen (PI, UCR) J. Rotenberry, D. Jenerette Co-PIs, UCR. (UCR portion \$3,000,000). CCR-0120778.

CVCC-ICF J&S- MSHCP Monitoring Program Administrator. ICF Incorporated. 2008-2012. M.F. Allen, PI. \$477,658.

Automated-Minirhizotron and Arrayed Rhizosphere-Soil Sensors (A-MARSS). EF-0410408. \$1,998,999 (2004-2010). National Science Foundation. M.F. Allen (PI), E.B. Allen, J. Borneman, M.P. Hamilton, and T.C. Harmon (Co-PIs).

Evaluating wildlife corridor linkages: Do underpasses connect the peninsular and transverse mountain ranges at Stubbe, Cottonwood, and Whitewater Canyons. Friends of the Desert Mountains. \$33,413. 2010-2011. M.F. Allen (PI), Michelle Murphy (student).

Community Foundation serving Riverside & San Diego Counties. \$2,618 2010-2011. M.F. Allen (PI), Michelle Murphy (student).

Understanding the algal bloom on the vernal pool of the Santa Rosa Plateau. TNC, \$11,774. 2009-2010. M.F. Allen (PI).

The utility of habitat corridors for providing connectivity for Palm Springs Pocket Mouse populations in the Coachella Valley. Coachella Valley Association of Governments. \$42,429. 2008. M.F. Allen PI.

County of Riverside: The science behind MSHCPs. Western Riverside County Regional Conservation Authority. \$200,000. 2006-2009. M.F. Allen, PI.

Dissertation: Ecophysiology of epiphyte establishment in the Yucatan Peninsula. \$11,991 (2007-2008). UC MEXUS. M. F. Allen and Laurel Salzman.

Dissertation: The importance of water for seedling establishment and tree growth in a seasonally dry tropical forest in Quintana Roo. \$11,774 (2006-2008) UC MEXUS. M. F. Allen and N. Hasselquist

Impact of hurricane Wilma, a large "infrequent" enrichment disturbance on tropical seasonal forest: Establishing the legacy effect on the post-disturbance mosaic. DEB-0615427. \$94,236 (2006-2007). National Science Foundation. M.F. Allen (PI), E.B. Allen, J.Rotenberry (Co-PIs).

2006-2007 Coachella Valley MSHCP Monitoring Framework Priorities. Coachella Valley Association of Governments. M.F. Allen. \$190,000

2005-2006 Coachella Valley MSHCP Monitoring Framework Priorities. Coachella Valley Association of Governments. M.F. Allen. \$169,242

Dissertation: Soil Dynamics in a tropical seasonal forest: from natural succession to ecological restoration. \$11,895 (2005-2006). UC MEXUS. M.F. Allen and R. Vargas.

Hydrologic properties of amargosa niterwort and ash meadows gum plant. \$20,000 (2004-6). Bureau of Land Management. M.F. Allen, PI.

Sevilleta LTER III: Long-term ecological research in a biome transition zone. \$4,200,000 (Oct 2000-Sept 2006). S. Collins, M.F. Allen, et al.

The nitrogen cycle of a semi-arid grassland: A fungal loop?. \$120,000 (2005-6), National Science Foundation, R.L. Sinsabaugh PI, M.F. Allen, S.L.Collins, and D.T. Hanson, Co-PIs.

Collaborative proposal: Biocomplexity: Common mycorrhizal networks—Active or Passive Channels? Interacting roles of mycorrhizal fungi, soil resources, and plants in carbon and nutrient transfers. DEB-9981548. \$866,286 (1999-2004). National Science Foundation. M.F. Allen. Collaborative with UC-Davis, Southern Oregon University.

Restoring seasonal tropical forests in Mexico: using designer communities to direct succession. DEB 9981607. \$250,000 (2000-2004) National Science Foundation. E.B. Allen, M.F. Allen, A. Gomez-Pompa, E. Rincon, P Huante.

Collaborative proposal: Factors regulating below-ground carbon allocation in terrestrial ecosystems: A cross-site experiment. \$287,089. (1997-2001). National Science Foundation, Ecosystem Studies. M.F. Allen. Collaborative with Michigan Technological University, University of Georgia, University of Alaska.

Biological monitoring-habitat relationships development, and working group establishment. \$200,627 (2004-5), Coachella Valley Association of Governments. M.F. Allen. Report on line at <http://repositories.cdlib.org/ccb/>

Western Riverside County Multiple Species Wildlife Assessment Project. \$626,490 (2003-2005). California Department of Fish and Game. M.F. Allen. Report on line at <http://repositories.cdlib.org/ccb/>

Western Riverside County and Sierra Nevada Wildlife Assessment Project. \$331,032 (2002-2004). California Department of Fish and Game. M.F. Allen.

Water dynamics and management during the establishment of tree species in agroforestry systems of the Yucatan dry tropics. \$24,987 (2001-2), UC-MEXUS. M. F. Allen, J.I. Querejeta, and J.Jimenez (UADY).

Biological monitoring-habitat relationships development, and working group establishment. \$331, 000 (2002-4), Coachella Valley Association of Governments. M.F. Allen

Task for the Western Riverside County Multiple Species Habitat Conservation Plan. \$140,345 (1999-2003). County of Riverside. M.F. Allen. Report on line at <http://repositories.cdlib.org/ccb/>

Environmental Data Management, Storage, and Access, \$252,642 (1999-2004), Metropolitan Water District, M.F. Allen and T. Scott

Biocomplexity—Incubation Activity: Designing a sustainable southern California: Exploring interdisciplinary studies of complexity in natural and human systems. \$99,501 (2000-2001). National Science Foundation. G. Tonnesen, M. Allen, W. Jury, J. Allison, E. Anderson, and J. Lents.

Isotope and genetic studies to assess microbial carbon storage in natural and human-altered environments. \$12,510 (2000-2002). Lawrence Livermore National Laboratory. M.F. Allen and K.K. Treseder.

California Ecosystems Research. \$74,276. (2000-2002). USGS/BRD. M.F. Allen and W. Boarmann.

Responses of soil microorganisms and microbial-mediated processes during succession to elevated CO₂ in a Mediterranean-type ecosystem. Department of Energy, Program for Ecosystem Research. \$1,149,596. (Sept 1993-Aug 2000). M. F. Allen.

A biodiversity survey of poorly-known taxa from Quintana Roo, Mexico. \$15,000 (2000-2001) UC MEXUS-CONACYT. A. Gomez-Pompa and M.F. Allen.

Effects of nitrogen deposition on the demography and community composition of mycorrhizal fungi in Shipley-Skinner Reserve. \$17,000 (2000). Shipley-Skinner Endowment. K. Treseder and M.F. Allen.

Slender Horned Spineflower Research. California Department of Fish and Game. \$35,000. 1998-1999. M.F. Allen and T. Zink.

Effects of exotic grasses on mycorrhizae and oak recruitment in the Shipley-Skinner Reserve. \$20,000 (1999). Shipley-Skinner Endowment. O. Karen and M.F. Allen.

Antelope Valley Dust Mitigation Research. Southern California Edison. \$38,000. 1998-1999. M.F. Allen and T. Zink.

Restoration of Plants and Mycorrhizae in Mexican Seasonal Tropical Forest. National Science Foundation. DEB 96222352. \$180,000 (1996-1999). E.B. Allen, PI, M.F. Allen, A. Gomez-Pompa, E. Rincon, Co-PI's.

Effects of elevated CO₂ and climate change on oak forest productivity and nutrient dynamics in Tuscan Forests. NASA. \$66,000 (1995-1999). C. Hinkson and M.F. Allen, PI's.

Long-term Natural CO₂ Enrichment of a Mediterranean Mixed-Oak Forest. National Science Foundation Dissertation Improvement Grant. \$10,000 (1996-1998). C. Hinkson and M.F. Allen, PI's.

Alternative Stable States in Rangelands: Regulation by Nitrogen Eutrophication. USDA/NRI. \$85,922, 1995-1998. E.B. Allen, PI, M.F. Allen, Co-PI.

CALTRANS Desert Restoration. \$330,000. (1996-1999). M.F. Allen and D. Bainbridge.

Desert Lands Task Force WEB Page. \$26,000. 1997-1999. M.F. Allen and T. Zink.

Fort Irwin Desert Restoration. Department of Defense. \$275,000 (1996-1999). M. F. Allen and T. Zink, PI's.

29 Palms Marine Corps Air-Ground Combat Center Revegetation. \$190,000. (1994-1999). M.F. Allen and T. Zink.

Reestablishment of Desert Plants. California Department of Transportation. \$481,000 (1993-96). M.F. Allen and D. Bainbridge.

U.S. Navy Submarine Base Revegetation. \$150,000. (1995-1999). M.F. Allen and T. Zink.

NRAD, Pt. Loma Restoration. \$49,000. (1996-1998). M.F. Allen and T. Zink.

Palos Verdes Blue Butterfly Restoration. Department of Navy. \$20,000, 1996-1998. M.F. Allen and T. Zink.

Revegetation Research. Castle Mountain Mine. \$135,927 (1993-5). M.F. Allen and David Bainbridge.

Harbingers of ecosystem stress: mycorrhizal fungi and weedy plants. Environmental Protection Agency. \$215,000 (1991-1994). M.F. Allen, C. Dahm, and E.B. Allen.

Rhizosphere formation and hydraulic lift in indian ricegrass: rhizosphere composition and nitrogen fixation. National Science Foundation, Dissertation Improvement Grant. DEB 9212824 \$9,000 (1992-1994) M.F. Allen and J.D. Trent.

Hungry Valley RVA Restoration. California Department of Parks and Recreation. \$35,000 (1995-1997) M.F. Allen and D. Bainbridge.

Camp Pendleton Marine Base Non-vascular Plant Survey. \$51,350 (1994-1996). M. F. Allen and T. Zink.

FISC Bulk Fuel Restoration. \$35,000 to date, renewals awarded annually. (1996-1997) M.F. Allen and T. Zink.

Restoration of Coastal-Sage Scrub. California Department of Transportation. \$106,000. (1993-1994). E.B. Allen and M.F. Allen

South Flat Restoration Research. Red Rock Canyon State Park \$53,422 (1992-1995). M.F. Allen and D. Bainbridge.

Influence of rhizosphere -mycosphere chemistry on phosphorus dynamics in an arid ecosystem. National Science Foundation, Ecosystems Studies Program. BSR 8818266. \$175,970 (1989-1992) E.B. Allen and M.F. Allen.

Reciprocal Relationships of Distant Sagebrush Communities with their Mycorrhizal Fungi. National Science Foundation, Ecology Program. BSR 8818076. \$277,471 (1989-1992) E.B. Allen, M.F. Allen, and L. Schulz.

Comparative movement in the environment of nuclear and extranuclear genetic elements in a microbial system. Environmental Protection Agency, Risk-Assessment Competitive Grants Program. \$50,000 (1990-1992). M.F. Allen (subcontract from Texas A&M).

Eighth North American Conference on Mycorrhizae. National Science Foundation, Ecology Program. \$12,000 (1990-91) M.F. Allen.

Mechanisms of P uptake and Competition of Nonmycotrophic with Mycotrophic Plants. United States Department of Agriculture, Competitive Grants Program, Environmental Stress 88-37264-4026 \$60,000(1988-1990). E.B. Allen and M.F. Allen

Development of methods for tracking genes of parasitic and mutualistic fungi in a chaparral ecosystem. SDSU Grant-in-aid. \$2,000 (1/1/89-6/30/90) M.F. Allen.

Reestablishment of mycorrhizae on Mount St. Helens. USDA Forest Service. \$1,000 (6/90-12/90). M.F. Allen.

A comparison of current and alternative practices in roadside revegetation. CALTRANS. \$50,000 (1/89-12/90) E.B. Allen and M.F. Allen.

Reconstruction of Ecosystems in Arid Lands: Final Synthesis. National Science Foundation, Ecosystems Studies Program. BSR 8807342. \$25,359 (1988- 1989) M.F. Allen (Subcontract from Utah State University).

Comparative movement in the environment of nuclear and extranuclear genetic elements in a microbial system. Environmental Protection Agency, Risk-Assessment Competitive Grants Program. R813751-01-0. \$203,000 (1987-1989). M.F. Allen and Neal Van Alfen.

Development of Methods for Tracking Genes of Mutualistic Fungi in a Chaparral Ecosystem. SDSU Research, Scholarship and Creative Activity Award \$2600 (2/1/1989-5/30/1989) M.F. Allen.

Reconstruction of Ecosystems in Arid Lands. National Science Foundation/Ecosystem Studies Program. BSR 83-17358, \$1,898,000 (1984-1988). J.A. MacMahon, M.F. Allen, L.E. Hipps, J.J. Jurinak, N.E. West, and G. Wooldridge.

The Role of Mycorrhizae in Competition between Weeds and Grasses. USDA/ARS 85-CRSR-2-2719 \$90,000 (1985-1988) E.B. Allen and M.F. Allen.

Interactions of Range grasses, weeds, and VA mycorrhizae: Carbon balance and competition. USDA Special Research Grants Program/Rangeland Research \$63,196 (1986-88) E.B. Allen and M.F. Allen.

The process and mechanisms of plant competition in the Great Basin, National Science Foundation/Ecosystem Studies, Physiological Ecology (1987) M.M. Caldwell, J.H. Richards & D.A. Pyke (PI's) M.F. Allen et al. collaborators.

Mechanisms of Herbivory Tolerance and Competition in the Sagebrush/Bunchgrass Ecosystem. National Science Foundation/Ecosystem Studies Program BSR-8207171 (1983-1987). M.M. Caldwell and J.H. Richards (PI's). M.F. Allen et al. (collaborators).

Establishment of and plant responses to exotic VA mycorrhizal fungi. USU University Faculty Research Grant \$10,613 (1986-87) M.F. Allen.

Dissolution of hydroxyapatite in the presence of oxalate. U.S.U. University Faculty Research Grant \$9,000 (1986-87). L.M. Dudley, J.J. Jurinak and M.F. Allen.

The Role of Mycorrhizae in Competition between Weeds and Rangeland Grasses. USDA/ARS 83-CRCR-1-1229 \$70,000 (1983-1985). E.B. Allen and M.F. Allen.

The Role of Mycorrhizae in Reversing Desertification. USDA/CSRS 83- CRSR-2-2274 \$79,899 (1983-1985). E.B. Allen and M.F. Allen.

Vesicular-arbuscular Mycorrhizae of Disturbed Alpine Ecosystems. USDA/Forest Service \$8,954 (1983-1985). M.F. Allen and E.B. Allen.

Mycorrhizal examination of successional sand dunes: a comparison of coastal and inland sites. Cape Cod National Seashore (1985). E.B. Allen and M.F. Allen.

Reconstruction of Ecosystems in Arid Lands. National Science Foundation/Ecosystem Studies Program DEB 81-01827 \$1,292,352 (1981- 1984). J.A. MacMahon, G.S. Innis, M.F. Allen, B.A. Haws, L.E. Hipps, J.J. Jurinak, N.E. West, and G. Wooldridge.

Influence of Mycorrhizae on Wheat Production. Nebraska Wheat Committee \$18,000 (1981). M.F. Allen and M.G. Boosalis.

Effect of Vesicular-arbuscular Mycorrhizae on Plant Hormone Levels, Water Relations, and Photosynthesis. National Science Foundation/Ecology Program DEB 7825 222 \$45,200 (1980-1982). (with M. Christensen, PI).

Effects of VA Mycorrhizae on Water Stress Tolerance and Hormone Balance in Native Western Plant Species. Rocky Mountain Institute of Energy and Environment \$20,588 (1978-1979). M. Christensen and M.F. Allen.