

Michala Phillips

Postdoctoral Research Associate - Ecologist

United States Geological Survey

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[Google Scholar](#)

EDUCATION

Ph.D. Plant Biology, Plant Ecology emphasis (August 2014-May 2019)

University of California, Riverside, Department of Plant Biology, Riverside, CA. **Advisor:** Dr. Edith Allen

Dissertation: "Invasion in the Chaparral: Uncovering Soil Microbial and Plant Physiological Mechanisms"

M.S. Environmental Science (August 2012-May 2013)

American University, College of Arts and Sciences, Washington, D.C.

B.A. in Environmental Studies (August 2010-May 2012)

American University, College of Arts and Sciences, Washington, D.C.

RESEARCH INTERESTS

I am passionate about using basic science to create knowledge that can be used to support sustainable restoration and management needs of ecosystems. My research bridges multiple disciplines to build a better understanding of how biotic interactions, disturbance and global change mediate community assembly of plants and soil microbes to affect emergent ecosystem functions. I integrate community, ecosystem, plant and microbial ecology in my research by using statistical modeling to combine data from a diversity of approaches (field, greenhouse, sensor networks, soil chemistry and molecular biology techniques). My aim is to build a better understanding of community assembly and ecosystem processes following disturbances to inform restoration and adaptive land management efforts.

RESEARCH EXPERIENCE

Ecologist (September 2019-present)

U.S. Geological Survey, Southwest Biological Science Center, Moab, UT. **Advisor:** Dr. Sasha Reed

Graduate Student Researcher (August 2014 – May 2019)

University of California Riverside, Botany & Plant Sciences, Riverside CA. **Advisor:** Dr. Edith Allen

Visiting Graduate Student Researcher (September 2017 – February 2019)

NASA, Jet Propulsion Laboratory, Pasadena, CA. **Advisor:** Dr. Joshua Fisher

Research project: Build a belowground trait map of the U.S. using remote sensing aimed at increasing the accuracy of terrestrial biosphere models

Graduate Student Researcher (2016 – 2017)

National Fish and Wildlife and U.S. Forest Service. **Advisors:** Drs. Edith Allen and Carla D'Antonio

Research project: Evaluation and restoration of degraded chaparral within Piru Fire perimeter.

PUBLICATIONS

1. Steven, B., **Phillips, M.L.**, Belnap, J., Gallegos-Graves, L.V., Kuske, C.R., Reed, S.C. Resistance, Resilience, and Recovery of Dryland Soil Bacterial Communities Across Multiple Disturbances. *Frontiers in Microbiology*, <https://doi.org/10.3389/fmicb.2021.648455>
2. **Phillips, M.L.**, Winkler, D.E., Reibold, R.H., Osborne, B.B., Reed, S.C. (2021) Muted responses to chronic experimental nitrogen deposition on the Colorado Plateau. *Oecologia*, <https://doi.org/10.1007/s00442-020-04841-3>
3. Howell, A., Winkler, D., **Phillips, M.L.**, McNellis, B., and Reed, S.C. (2020) Warming shortens growing season length of the dominant invasive *Bromus tectorum* (cheatgrass). *Frontiers in Plant Science*, <https://doi.org/10.3389/fpls.2020.570001>
4. Collins, C.G., Spasojevic, M., Alados, C., Aronson, ..., **Phillips, M.L.**, ..., Diez, J. (2020) Belowground Impacts of Alpine Woody Encroachment are determined by Plant Traits, Local Climate and Soil Conditions. *Global Change Biology*, <https://doi.org/10.1111/gcb.15340>

5. **Phillips, M.L.**, Aronson, E.L., Maltz M.M., Allen, E.B. (2020) Native and invasive inoculation source can modify fungal community assembly and biomass production of a chaparral shrub. *Applied Soil Ecology*, <https://doi.org/10.1016/j.apsoil.2019.103370>
6. Schmidt, K.T. Maltz, M.R., Ta, P., Khalili, Weihe, C., **Phillips, M.L.**, Aronson, E.A., Lulow, M., Long, J., Kimball, S. (2020) Identifying Mechanisms for Successful Ecological Restoration with Successful Ecological Restoration with Salvages Topsoil in Coastal Sage Scrub Communities. *Diversity*, <https://doi.org/10.3390/d12040150>
7. **Phillips, M.L.**, McNellis, B.E, Allen, M.F., Allen, E.B. (2019) Establishment of an invasive plant leads to differences in water-relations and root development in a Mediterranean ecosystem. *American Journal of Botany*, <https://doi.org/10.1002/ajb2.1344>
8. **Phillips, M.L.**, Weber, S.E., Andrews L.V., Aronson, E.A, Allen, M.F., Allen, E.B. (2019) Fungal community assembly in soils and roots under plant invasion and nitrogen deposition. *Fungal Ecology*, <https://doi.org/10.1016/j.funeco.2019.01.002>
9. Allen, E.B., Williams, K. Beyers, J.L. **Phillips M.L.**, Ma, S., D'Antonio, C.M. "Chaparral Restoration." *Valuing Chaparral: Ecological, Socio-Economic and Management Perspectives*. Springer, Cham, 2018. 347-384.

PUBLICATIONS (in preparation or review; Manuscript available on request)

10. **Phillips, M.L.**, McNellis, B.E., Howell, A.J., Lauria, C.M, Belnap, J., Reed, S.C. Increased potential for disturbance-induced desertification in a warming world. *In review, Nature Climate Change*
11. Osbourne, B.B., Roybal, C., Reibold, R.H., Collier, C., Geiger, E., **Phillips, M.L.**, Weintraub, M., Reed, S.C., Biogeochemistry resists nitrogen deposition but is sensitive to edaphic variation in three semiarid grasslands. *In review, Ecology*.
12. **Phillips, M.L.**, Allen, E.B. Restoring California chaparral: Invasive grass density differentially affects soil water status and native seedling survival. *In prep.* Target Journal: *Restoration Ecology*.

GRANTS, FELLOWSHIPS, AND AWARDS (Total = \$443,370)

2021	NSF Postdoctoral Fellowship in Biology (\$138,000)
2021	USDA-NIFA Postdoctoral Fellowship (\$164,883 – Declined)
2018	UCR W.W. Thomson Award for Outstanding Research (\$1200)
2018	Student Travel Grant , California Invasive Plant Council (\$250)
2018	Student Travel Grant , Ecosystem Science Principal Investigator's Meeting, Department of Energy (\$800)
2018	3rd place in Student Oral Presentation Contest , California Native Plant Society
2018	Student Travel Grant , California Native Plant Society (\$250)
2017	Shiplee Skinner Grant , Center for Conservation Biology (\$3,800)
2016	Best Student Poster , California Invasive Plant Council
2016-2019	NASA MIRO FIELDS Fellowship (\$76,000)
2016	Shiplee Skinner Grant , Center for Conservation Biology (\$12,000)
2016	Research Fellowship , Institute for the Study of Ecological and Evolutionary Climate Impacts (\$11,000)
2015	Shiplee Skinner Grant , Center for Conservation Biology (\$19,987)
2015	Mini Grant , California Native Plant Society (\$200)
2015	Scholarship , Soil Summer Soil Institute at Colorado State University
2014-2016	Dean's Distinguished Fellowship , University of California Riverside (\$14,500)
2012	Graduate Student Research Fund Competition , American University (\$500)

SYNERGISTIC ACTIVITIES *(cancelled due to COVID-19)

Organizer, Science for Guides* (2020)

Pod co-lead, 500 Women in Science Moab Pod (2020 – ongoing)

Organizer, Canyon Country Working Group annual meeting* (2020)
Organizer, Moab Festival of Science (2020 – ongoing)
Co-Founder and Lead Organizer, [Women in Soil Ecology Network](#) (2020 – ongoing)
Invited Speaker, California Native Plant Society, Riverside Chapter (2018)
Station Leader, UCR “Plant Discovery Day” (2017)
Event Coordinator, Riverside Metropolitan Museum “Fungal Discovery day” (2016)

PRESENTATIONS

- Phillips, M.L.**, McNellis B.E., Howell, A., Lauria, C., Belnap, J., Reed, S.C. Building a recovery clock: Tracking biological soil crust recovery following chronic physical and climate disturbance? Ecological Society of America annual Meeting, Oral Presentation. August, 3, 2020.
- Phillips, M.L.**, McNellis B.E., Howell, A., Lauria, C., Belnap, J., Reed, S.C. Keystone dryland communities follow novel trajectories following chronic physical and climate disturbances. PUGSLEY virtual symposia, Invited Oral Presentation. May, 7, 2020.
- Phillips, M.L.**, Allen, E.B. How do invasive grass water-use strategies affect belowground ecosystem services and native shrub re-establishment? California Invasive Plant Council. Monterrey, CA. November, 7, 2018.
- Phillips, M.L.**, Weber, S.E., Andrews L.V., Aronson, E.A, Allen, M.F., Allen, E.B. Fungal community assembly in soils and roots under plant invasion and nitrogen deposition. August 9th, 2018. Ecological Society of America annual Meeting. New Orleans, LA. Oral Presentation.
- Phillips, M.L.**, Allen, E.B. Do invasive grasses water use strategies serve as a barrier to chaparral restoration? May 14th, 2018. Chaparral Workshop. Arcadia, CA. Poster.
- Phillips, M.L.**, Fisher, J.B., Brzostek, E.R, Sweeney, S. Evans, T.P., Zhu, K. Phillips, R.P. Remote Sensing of Mycorrhizal Distributions. May 2nd, 2018. Department of Energy Ecosystem Science Principal Investigators Meeting Potomac, MD. Poster.
- Phillips, M.L.**, Allen, E.B. Do invasive grasses water use strategies serve as a barrier to chaparral restoration? February 2, 2018. California Native Plant Society. Los Angeles, CA. Oral Presentation.
- Phillips, M.L.**, McNellis, B.E., and Allen, E.B. Invasive grasses employ different water use and rooting strategies than a native chaparral shrub. August 7-11, 2017. Ecological Society of America annual meeting. Portland, OR. Oral Presentation.
- Phillips, M.L.**, Andrews, L., and Allen, E.B. Invasion shifts soil fungal community composition in chaparral community. Institute for the Study of Ecological and Evolutionary Climate Impacts Research Symposium. Sedgwick Reserve, UC Santa Barbara. May 5-7, 2017. Invited Oral Presentation.
- Phillips, M.L.**, Andrews, L., and Allen, E.B. Invasion shifts soil fungal community composition in chaparral community. Soil Ecology Society. Fort Collins, CO. June, 5-9, 2017. Poster.
- Phillips, M.L.**, McNellis, B.E., and Allen, E.B. Do invasive grasses employ different water use and rooting strategies than a native chaparral shrub? California Invasive Plant Council. Fish Camp, CA. November, 4, 2016. Poster.

TEACHING EXPERIENCE

- 2016 **Teaching Assistant** – BPSC-146 Plant Ecology
*Developed and presented a 90-minute guest lecture: “Global Change”
*Led a laboratory and field experiment on Plant physiology.
- 2015 **Teaching Assistant** – BPSC-104 Foundations of Plant Biology
- 2013 **Teaching Assistant** – University College-Sustainable Earth

WORKSHOPS

- 2020 Hierarchical Modeling of Species Communities
- 2015 Soil Summer Institute – Colorado State University

MENTORING

University of California, Riverside**Undergraduate mentees:**

Sara Arps (2015-2016) Aleric Krenz (2015-2017) Cierra Wikman (2016-2017)
Alexandra Johnson (2016-2017) Robert Grant (2017)

Direct Supervisor for Sameer Saroa, Research Technician (2017-2018)

United States Geological Survey**Technician mentees:**

Armin Howell (2019 - ongoing) Cara Lauria (2019 - ongoing)

Women in Soil Ecology Mentorship Program

Courtney Currier (Graduate Student at Arizona State University; 2020-ongoing)

SKILLS

- Extensive field project management experience – leading and organizing large-scale field campaigns with technicians and volunteers for experimental landscape restoration.
- Substantial experience with plant identification, plant physiological ecology field measurements (e.g. LI-COR 6400 and 6800), monitoring plant phenology, deploying and maintaining ecoinformatics sensor networks, molecular lab work, and soil biogeochemical lab work.
- Skilled use of R statistical software, CRbasic, bash, and QIIME. Including Experience with large datasets, work in command line, and access to external servers.
- Strong background in applied statistics – linear/non-linear and mixed effects modeling, Bayesian multi-level modeling, Joint species distribution modeling, Multivariate analyses/Ordination, Indicator species analysis, community analyses in Vegan, and time series analyses.
- Experience with geospatial analyses using ArcGis and remote sensing using satellite imagery in R.
- Reproducible research workflows in Github.
- Graphics in ggplot and Adobe Illustrator.