

JESSICA SIJIA GUO

CCT Data Science Group
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EDUCATION

PhD, May 2019, Biology, Northern Arizona University
Certificate of Statistics, 2015, Mathematical and Statistical Sciences, Arizona State University
MS, December 2013, Biology, Northern Arizona University
BA, May 2010, *magna cum laude*, Environmental Biology, Columbia University

APPOINTMENTS

2020- Data Scientist, CCT Data Science Group, University of Arizona
2019-2020 Postdoctoral Scientist, Geology and Geophysics, University of Utah
2016-2019 Graduate Teaching Assistant, Biological Sciences, Northern Arizona University
2015 STEM Outreach Fellow, NASA Space Grant, Arizona State University

PUBLICATIONS

* as statistical consultant

Published

- Guo, J.S.**, S.E. Bush, K.R. Hultine. 2022. Temporal variation in stomatal sensitivity to vapor pressure deficit in western riparian forests. *Functional Ecology*.
<https://doi.org/10.1111/1365-2435.14066>
- Bowen, G.J., **J.S. Guo**, S. Allen. 2022. A 3-D groundwater isoscape of the contiguous USA for forensic and water resource science. *PLOS One*. 17(1): e0261651.
- Kannenberg, S., **J.S. Guo**, K. Novick, W. Anderegg, X. Feng, D. Kennedy, A. Konings, J. Martínez-Vilalta, A. Matheny. 2022. Opportunities, challenges, and pitfalls in characterizing plant water-use strategies. *Functional Ecology*. 36(1): 24-37.
- Peltier, D.M.P., **J.S. Guo**, P. Nguyen, M. Bangs, L. Gear, M. Wilson, S. Jefferys, K. Samuel-Crow, L.L. Yocom, Y. Liu, M.K. Fell, D. Auty, C. Schwalm, W.R.L. Anderegg, G.W. Koch, M.E. Litvack, K. Ogle. 2021. Temperature memory and NSC mediate legacies of a hot drought in trees across the southwestern US. *Tree Physiology*. 42(1): 71-85.
- *Mpanga, I.K., R. Tronstad, **J.S. Guo**, D. LeBauer, J. Idowu. 2021. On-farm land management strategies and production challenges in United States organic agricultural systems. *Current Research in Environmental Sustainability*. 3: 100097.
- Nagy, R.C., J.K. Balch, [et al., including **J.S. Guo**]. 2021. Harnessing the NEON data revolution to advance open environmental science with a diverse and data-capable community. *Ecosphere*. 12(12): e03833.

- Fiorella, R.P., S.P. Good, S.T. Allen, **J.S. Guo**, C.J. Still, D.C. Noone, W.R.L. Anderegg, C.R. Florian, H. Luo, N. Pingintha-Durden, G.J. Bowen. Calibration strategies for detection macroscale patterns in NEON atmospheric carbon isotope observations. *Journal of Geophysical Research – Biogeosciences*. 126(3).
- Bush, S.E., **J.S. Guo**, D. Dehn, K. Grady, J. Hull, E. Johnson, D. Koepke, R. Long, D. Potts, K. Hultine. 2021. Adaptive versus non-adaptive responses to drought in a non-native riparian tree / shrub (*Tamarix* ssp.). *Agricultural and Forest Meteorology*. 301-302: 108342.
- Peltier, D.M.P., **J.S. Guo**, P. Nguyen, M. Bangs, L. Gear, M. Wilson, S. Jefferys, K. Samuel-Crow, L.L. Yocom, Y. Liu, M.K. Fell, D. Auty, C. Schwalm, W.R.L. Anderegg, G.W. Koch, M.E. Litvack, K. Ogle. 2020. Temporal controls on crown non-structural carbohydrates and links to sapwood storage in southwestern US tree species. *Tree Physiology*. 41(3): 388-402.
- Guo, J.S.**, L. Gear, K.R. Hultine, G.W. Koch, K. Ogle. 2020. Non-structural carbohydrate dynamics associated with antecedent stem water potential and air temperature in a dominant desert shrub. *Plant, Cell & Environment*. 43(6): 1467-1483.
- Guo, J.S.**, K.R. Hultine, G.W. Koch, H. Kropp, K. Ogle. 2020. Temporal shifts in iso/anisohydry revealed from daily observations of plant water potential in a dominant desert shrub. *New Phytologist*. 225(2): 713-726.
- Ogle, K., D.M.P. Peltier, M.K. Fell, **J.S. Guo**, H. Kropp, J.J. Barber. 2019. Should we be concerned about multiple comparisons in hierarchical Bayesian models? *Methods in Ecology and Evolution*. 10(4): 553-564.
- Guo, J.S.** and K. Ogle. 2019. Antecedent soil water content and vapor pressure deficit interactively control water potential in *Larrea tridentata*. *New Phytologist*. 221(1): 218-232.
- Guo, J.S.**, B.A. Hungate, T.E. Kolb, G.W. Koch. 2018. Water source niche overlap increases with site moisture availability in woody perennials. *Plant Ecology*. 219(6):719-735.

In review

- Kannenberg, S.A., M.L. Barnes, D.R. Bowling, A.W. Driscoll, **J.S. Guo**, W.R.L. Anderegg. Quantifying the drivers of ecosystem carbon-water cycling across the soil-plant-atmosphere continuum in an arid woodland. Submitted to *Agricultural and Forest Meteorology*.

In revision

- Peltier, D.P., W.R.L. Anderegg, **J.S. Guo**, K. Ogle. Contemporary tree growth shows altered climate memory. Accepted at *Ecology Letters*.
- *Gornish, E.S., **J.S. Guo**, L.M. Porensky, B.L. Perryman, E.A. Leger. Pre-fire grazing treatments can affect post-fire vegetation in a dryland system. Submitted to *Ecological Solutions and Evidence*.

TEACHING

Data science workshops

Reproducibility and Data Science in R (U of Arizona)

Sep 2022

Data wrangling and visualization (U of Arizona BRIDGES)	May 2022
Dates and Times in R (U of Arizona)	Apr 2022
Reproducibility and Data Science in R (U of Arizona)	Feb 2022
Intro to Bayesian modeling (NCEAS)	Oct 2021
Critical Skills to Scale Up Ecology (ESA-SEEDS)	Sep 2021
Intro to Bayesian modeling in Ecology (ESA short course)	Aug 2021
Fitting leaf -level gas exchange data in R (U of Arizona)	Apr 2021

Instructor of record

Scientific Writing in Microbiology, upper-division	Spr 2018, Fa 2018, Spr 2019
Ecology Lab, upper division	Spr 2017

Teaching assistant

Applied Bayesian Modeling Lab, graduate	Fa 2016, Fa 2017
Biometry Lab, graduate	Fa 2014
Diversity of Life Lab, introductory	Spr 2013
Unity of Life Lab, introductory	Spr 2012, Fa 2012, Fa 2013

Guest lecturer

Plants and Climate, upper-division	Spr 2017
Biometry, graduate	Fa 2014

FELLOWSHIPS

2019	Columbia University Earth Institute Postdoctoral Fellowship (declined)
2015	ASU/NASA Space Grant Fellowship (Spring/Summer/Fall, \$25,400)
2011	Science Foundation of Arizona Graduate Fellow (\$8400)
2006-10	TW Lewis Foundation Scholar (\$20,000)

AWARDS AND HONORS

Research/Teaching

2019	Research and Creativity Award: Most Promising Graduate Student
2018	Outstanding Graduate Teaching Award
2018	Graduate College Scholarship
2018	Jerry O. Wolff Student Enrichment Scholarship
2017	Honorable mention: Billings Award for an oral presentation at the ESA
2016	Brian Layton Cardall Memorial Scholarship
2015	Michael A. Cichan Memorial Award for Excellence in Botany
2012	Honorable Mention: NSF Graduate Research Fellowship

Travel

2020	ESA Power of Data Fellowship
2019	AGU Ecohydrology Tiny Grant award
2018	AGU Biogeosciences Section Caregiver Support award
2017	ESA Minority Ecologists Forum travel award

2016 ESA Physiological Ecology Section travel award

CONFERENCE ACTIVITY

Invited

- 2021 **Guo, J.S.**, S.E. Bush, K.R. Hultine. Talk title: Riparian tree species vary in stomatal sensitivity to vapor pressure deficit across an aridity gradient in the eastern Great Basin, US. 106th Ecological Society of America, Annual Meeting, Hybrid, Long Beach, CA, U.S.A., August 1-6.
- 2020 **Guo, J.S.**, K.R. Hultine, G.W. Koch, H. Kropp, K. Ogle. Talk title: Temporal patterns of plant water use: combining novel data and modeling approaches. 105th Ecological Society of America, Annual Meeting, Virtual, August 3-6.

Contributed

- 2022 **Guo, J.S.**, S. Kannenberg, M. Barnes, W.R.L. Anderegg. Talk title: Temporally-varying water use strategies in *Juniperus osteosperma* associated with GPP. 107th Ecological Society of America, Annual Meeting, Montreal, Quebec, Canada, August 14-19.
- 2022 **Guo, J.S.**, S. Kannenberg, M. Barnes, W.R.L. Anderegg. Poster title: Temporally-varying water use strategies in *Juniperus osteosperma* associated with GPP. 3rd Multiscale Plant Vascular Biology GRC, Newry, Maine, U.S.A., June 5-10.
- 2020 **Guo, J.S.**, S.T. Allen, R.P. Fiorella, C.J. Still, W.R.L. Anderegg, G.J. Bowen. Vertical partitioning of root distributions correlated with ecophysiological characteristics: initial results from NEON megapit data. American Geophysical Union, Fall Meeting, virtual, December 1-17.
- 2019 **Guo, J.S.**, H. Kropp, G. Koch, K. Hultine, W.R.L. Anderegg, S. Allen, G. Bowen, K. Ogle. Poster title: Declines in nighttime water potential vary seasonally in a common desert shrub. American Geophysical Union, Fall Meeting, San Francisco, CA, U.S.A., December 9-13.
- 2018 **Guo, J.S.**, K. Hultine, G. Koch, H. Kropp, K. Ogle. Poster title: Testing iso/anisohydry as a plant-environment interaction in *Larrea tridentata*. American Geophysical Union, Fall Meeting, Washington, D.C., U.S.A., December 10-14.
- 2018 **Guo, J.S.**, B. Hungate, T. Kolb, G. Koch. Talk title: Water source niche overlap increases with site moisture availability in woody perennials. Geological Society of America, Joint Rocky Mountain/Cordilleran Section Meeting, Flagstaff, U.S.A., May 15-17.
- 2017 **Guo, J.S.**, L. Gear*, K. Hultine, K. Ogle. Talk title: Seasonal trends in leaf non-structural carbohydrates driven by depletion of starch in *Larrea tridentata*. 102nd Ecological Society of America, Annual Meeting, Portland, U.S.A., August 6-11.
- 2016 **Guo, J.S.**, K. Ogle. Talk title: Antecedent soil moisture and VPD interactively control water potential and hydraulic thresholds in *Larrea tridentata*. 101st Ecological Society of America, Annual Meeting, Fort Lauderdale, U.S.A., August 7-12.
- 2015 **Guo, J.S.**, Hultine, K., Ogle, K. Poster title: Non-structural carbohydrates of woody plants in the Sonoran Desert. 100th Ecological Society of America, Annual Meeting, Baltimore, U.S.A., August 9-14.
- 2014 **Guo, J. S.**, B. Hungate, T. Kolb, and G. Koch. Poster title: Low water availability decreases niche overlap of soil water resources in woody perennials. 99th Ecological Society of America, Annual Meeting, Sacramento, U.S.A., August 10-15.

- 2012 **Guo, J.S.**, B. Hungate, T. Kolb, and G. Koch. Poster title: Variation in functional rooting depth and soil water partitioning along an elevation gradient in the southwestern U.S. American Geophysical Union, Fall Meeting, San Francisco, U.S.A., December 3-7.
- 2010 **Guo, J. S.**, J. I. Burton, M. I. Palmer, and D. J. Mladenoff. Poster title: Inter- and intra-specific functional trait response to environmental change in an herbaceous forest understory. 95th Ecological Society of America, Annual Meeting, Pittsburgh, U.S.A., August 1-6.

SERVICE, OUTREACH, AND MENTORSHIP

Professional service

- 2021 Ad-hoc review, NSF-IOS RCN proposal, Integrative Ecological Physiology Program
- 2020 NSF-IOS panel review, Integrative Ecological Physiology Program
- 2020 Organizer, Organized Oral Session at ESA “Plant water use strategies in a changing world”
- 2019 Ad-hoc review, NSF-IOS proposal, Integrative Ecological Physiology Program
- 2018 Co-organizer, Organized Oral Session at ESA “Ecophysiology of drought resilience and recovery”
- 2017 Organizer, Organized Oral Session at ESA “Evaluating lags and legacies of drought recovery”
- 2015 Travel grant reviewer, ASU Graduate and Professional Student Association
- 2014 Alumni career panelist, TW Lewis Foundation Leadership Conference, Phoenix, AZ
- 2012 Travel award reviewer, ESA-SEEDS
- Ongoing Member: Ecological Society of America, American Geophysical Union, Earth Science Women’s Network
- Ongoing Reviewer: *New Phytologist* (4), *Plant, Cell & Environment* (3), *American Journal of Botany* (1), *Tree Physiology* (1), *Methods in Ecology and Evolution* (1), *Trees* (1), *Plant and Soil* (2), *Conservation Physiology* (1), *Biogeosciences* (1)

Outreach

- 2022 Chaired annual Research Bazaar Arizona conference on data science
- 2022 Organizing committee for the Women in Data Science (WiDS) Tucson event
- 2021 R lesson on spatial analysis of precipitation isotopes, published by Project EDDIE
- 2020 R lesson on spatial analysis of urban tap water isotopes, distributed to network of citizen scientists volunteering for waterisotopes.org
- 2019 “Isotope forensics with human breath”, Picarro activity, Geology Open House, Salt Lake City, UT
- 2019 “Why do plants matter?” presentation to Southwest Youth Camp at Dine College, Flagstaff, AZ
- 2017-18 Scientist in the Classroom, Kathryn Wertz’s 6th grade science class, Flagstaff, AZ
- 2017 Organized the NAU chapter of ESA-SEEDS students on a regional fieldtrip to the Mt. Lemmon Sky School and the Biosphere II, Tucson, AZ
- 2017 Science in the Park, Flagstaff Festival of Science, Flagstaff, AZ
- 2017 Public talk, “Life on the edge: carbohydrate dynamics of the creosote shrub”, Desert Botanical Garden, Scottsdale, AZ
- 2016-17 Consulting ecologist to AP Bio teacher Linda Lenz, Flagstaff, AZ
- 2016-17 Math/Science tutor at Kinlani Bordertown Dormitory, Flagstaff, AZ

- 2015 Global change and big data in R workshop for high school girls, Mesa Public Schools, Mesa, AZ
- 2015 Quantitative lesson development and demonstration to secondary science teachers, Advance Water Educator workshop, Tempe, AZ
- 2015 Statistics in R module to AP Environmental Science class at BASIS Chandler, Chandler, AZ
- 2014 Co-organized ESA-SEEDS field trip to CAP-LTER, Phoenix, AZ
- 2013-14 Contributor to ASU Ask a Biologist website (<https://askabiologist.asu.edu/>)

Professional development - Research

- 2021 Container Camp, Cyverse, virtual
- 2019 NEON Science Summit, Boulder, CO (invited)
- 2019 SPATIAL short course, Salt Lake City, UT
- 2019 NextProf: Science workshop, Ann Arbor, MI (invited)
- 2016 1st annual PhysFest workshop on plant ecophysiology, Manhattan, KS (invited)
- 2015 NIMBioS graduate student workshop on ecological statistics, Knoxville, TN (invited)
- 2014 Software Carpentry workshop for R and Linux, Tempe, AZ

Professional development - Pedagogy

- 2022 Making career-spanning learning in the life sciences inclusive and effective for all, The Banbury Center, Cold Spring Harbor Laboratory, virtual (invited)
- 2021 Instructor Training, The Carpentries, virtual
- 2019 Project EDDIE curriculum development workshop, Northfield, MN (invited)
- 2019 University Teaching Day, Flagstaff, AZ
- 2013 Seminar on Scientific Teaching, Tempe, AZ
- 2011 Seminar on College Teaching, Flagstaff, AZ

Mentorship

- 2020 Remotely mentored Annelise Kelly and Bethany Alston as part of the MS for Secondary School Teachers program on R coding with NEON data
- 2019-20 Mentored U of U transfer student Michelle Williams
- 2016-17 Mentored NAU undergraduates Ryan Bishop and Linnea Gear; Linnea was funded as a NAU/NASA Space Grant Intern
- 2015 Alumni Mentor, ESA-SEEDS at 2015 ESA Annual Meeting, Baltimore, MD
- 2014-15 Mentored ASU undergraduates Samantha Daly, Joan Kwamboka, Brian Lopez, and Sam Teegarden; Sam was funded as an undergraduate research fellow by the School of Life Sciences
- 2012 Mentored NAU undergraduate Hannah Russell; Hannah was funded as a NAU/NASA Space Grant Intern
- 2011 Alumni Mentor, ESA-SEEDS at 2011 ESA Annual Meeting, Austin, TX