

Gregory E. Maurer

Jornada Basin LTER Program
P.O. Box 30003, MSC 3JER
New Mexico State University
Las Cruces, NM, 88003-8003
USA

tel: 801 716-0293 (mobile)
email: gregmaurer@gmail.com
web: <http://greg.pronghorns.net>

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Research and professional interests

I am a broadly-trained ecologist and environmental data scientist aiming to understand Earth's changing ecosystems, and to inform critical resource management and conservation efforts. My primary research interests are in the biogeochemistry and ecohydrology of drylands, particularly the effects of climate, global change, and disturbance on vegetation and soil systems. I wear many professional hats, including data analyst, data manager, co-PI, programmer, instructor, and working-group leader. I enjoy collaborating with diverse teams, am technologically savvy, and approach my work with an open-science philosophy.

Academic positions

Data Scientist and LTER Information Manager May 2019–present

Jornada Basin Long-term Ecological Research Program, New Mexico State University, Las Cruces, NM

Adjunct Faculty March 2023–present

School of Life Sciences, Arizona State University, Tempe, AZ

Instructor of Biology (Part-time): August 2018–December 2020

School of Math, Science, and Engineering, Central New Mexico Community College, Albuquerque, NM

Postdoctoral Scientist: September 2016–May 2019

Dept. of Environmental Science, Policy, and Management, University of California, Berkeley, CA

Postdoctoral Scientist: August 2014–September 2016

Department of Biology, University of New Mexico, Albuquerque, NM

Education

Ph.D., Biology, University of Utah, May 2014

B.S., cum laude, Biological Sciences, University of Alaska Fairbanks, 2001

Certifications

The Carpentries Instructor Certification, 2021

Certificate in Applied Geographic Information Science, University of Utah, 2007

Selected coursework:

Advanced Topics in Deep Learning for Image Processing, New Mexico State University/USDA ARS, 2021

Introduction to Image Processing, Classical Machine Learning, and Deep Learning, New Mexico State University/USDA ARS, 2021

Ameriflux Data and Tech Workshop, Lawrence Berkeley National Lab, 2015

Radiocarbon in Ecology and Earth System Science, University of California, Irvine, 2008

Advanced Statistical Modeling for Biologists, University of Utah, 2012

Peer-reviewed publications

See also <http://greg.pronghorns.net/publications.html>

- Amundson, R., J. V. Mills, L. N. Lammers, M. Barthel, N. Gallarotti, J. Six, G. Gebauer, and **G. E. Maurer**. Simultaneous Production and Consumption of Soil N₂O Creates Complex Effects on its Stable Isotope Composition. *Global Biogeochemical Cycles* (2023): e2022GB007536. <https://doi.org/10.1029/2022GB007536>
- Mills, J. V., **G. E. Maurer**, L. N. Lammers, and R. Amundson. 2022. Emergent Climate Change Impacts on the Soil C and N Cycles in the Mojave Desert. *Global Biogeochemical Cycles* 36, no. 9, <https://doi.org/10.1029/2021GB007254>
- Meng, B., J. Li, **G. E. Maurer**, S. Zhong, Y. Yao, X. Yang, S. L. Collins, and W. Sun. 2021. Nitrogen addition amplifies the nonlinear drought response of grassland productivity to extended growing-season droughts. *Ecology* <https://doi.org/10.1002/ecy.3483>
- Hallmark, A. J., **G. E. Maurer**, R. E. Pangle, and M. E. Litvak. 2021. Watching plants' dance: Movements of live and dead branches linked to atmospheric water demand. *Ecosphere*. 12, <https://doi.org/10.1002/ecs2.3705>
- Maurer, G.E.**, A.J. Hallmark, R.F. Brown, S.L. Collins, O.E. Sala. 2020. Sensitivity of primary production to precipitation across the United States. *Ecology Letters*. <https://dx.doi.org/10.1111/ele.13455>
- Oerter, E.J., J.V. Mills, **G.E. Maurer**, L.N. Lammers, R.G. Amundson. 2018. Greenhouse gas production and transport in desert soils of the southwestern USA. *Global Biogeochemical Cycles*. <https://doi.org/10.1029/2018GB006035>
- Rudgers, J.A., Y.A. Chung, **G.E. Maurer**, D.I. Moore, E.H. Muldavin, Collins, S.L. 2018. Climate sensitivity functions and net primary production: A framework for incorporating changes in climate mean and variability. *Ecology*. <https://doi.org/10.1002/ecy.2136>
- Morillas, L., R.E. Pangle, **G.E. Maurer**, W.T. Pockman, N.G. McDowell, C-W Huang, D.J. Kroscheck, A.M. Fox, R.L. Sinsabaugh, T.A. Rahn, M.E. Litvak. 2017. Tree mortality decreases water availability and ecosystem resilience to drought in piñon-juniper woodlands in the southwestern U.S. *JGR Biogeosciences*. <https://doi.org/10.1002/2017JG004095>
- Biederman, J.A., R.L. Scott, T. Bell, D.R. Bowling, S. Dore, J. Garatuza-Payan, T.E. Kolb, P. Krishnan, D.J. Kroscheck, M.E. Litvak, **G.E. Maurer**, T.P. Meyers, W.C. Oechel, S.A. Papuga, G.E. Ponce-Campos, J.C. Rodriguez, W.K. Smith, R. Vargas, C.J. Watts, E.A. Yepez, M.L. Goulden. 2017. CO₂ exchange and evapotranspiration across dryland ecosystems of southwestern North America. *Global Change Biology*. <https://doi.org/10.1111/gcb.13686>
- Maurer, G.E.**, A.M. Chan, N.A. Trahan, D.J.P. Moore, and D.R. Bowling. 2016. Carbon isotopic composition of forest soil respiration in the decade following bark beetle and stem girdling disturbances in the Rocky Mountains. *Plant, Cell, & Environment*, 39: 1513–1523. <https://doi.org/10.1111/pce.12716>
- Biederman, J.A., R.L. Scott, M.L. Goulden, R. Vargas, M.E. Litvak, T.E. Kolb, E.A. Yepez, W. C. Oechel, P.D. Blanken, T.W. Bell, J. Garatuza-Payan, **G.E. Maurer**, S. Dore, S.P. Burns. 2016. Terrestrial carbon balance in a drier world: the effects of water availability in southwestern North America. *Global Change Biology*. <https://doi.org/10.1111/gcb.13222>
- Maurer, G.E.**, and D.R. Bowling. 2014. Dust effects on snowpack melt and related ecosystem processes are secondary to those of forest canopy structure and interannual snowpack variability, *Ecohydrology*, 8: 1005–1023. <https://doi.org/10.1002/eco.1558>
- Hall, S.J., **G.E. Maurer**, S.W. Hoch, R. Taylor, D.R. Bowling. 2014. Impacts of anthropogenic emissions and cold air pools on urban to montane gradients of snowpack ion concentrations in the Wasatch Mountains, Utah. *Atmospheric Environment*, 98: 231–241. <https://doi.org/10.1016/j.atmosenv.2014.08.076>

Maurer, G.E. and D.R. Bowling. 2014. Seasonal snowpack characteristics influence soil temperature and water content at multiple scales in interior western U.S. mountain ecosystems, *Water Resources Research*, 50: 5216–5234. <https://doi.org/10.1002/2013WR014452>

Ruess, R.W., R.L. Hendrick, A.J. Burton, K. S. Pregitzer, B. Sveinbjornsson, M.F. Allen, **G.E. Maurer**. 2003. Coupling fine root dynamics with ecosystem carbon cycling in black spruce forests of interior Alaska, *Ecological Monographs*, 74: 643-662. <https://doi.org/10.1890/02-4032>

Reports and white papers

Gries, C., S. Beaulieu, R.F. Brown, S. Elmendorf, H. Garrett, G. Gastil-Buhl, H. Hsieh, L. Kui, M. Martin, G. Maurer, A.T. Nguyen, J.H. Porter, A. Sapp, M. Servilla, and T.L. Whiteaker. 2021. Data Package Design for Special Cases ver 1. *Environmental Data Initiative*. <https://doi.org/10.6073/pasta/9d4c803578c3fbcb45fc23f13124d052>

Juried conference abstracts

Specht, A., Bastin, G., Carter, J., Cowley, R., Diete, R., Facelli, J., Maurer, G., O'Reagain, P., Thornton, C. 2025. The value proposition for systematic long-term vegetation studies. *XII International Rangeland Congress*

Gries, C., S. Beaulieu, R. Brown, G. Gastil-Buhl, S. Elmendorf, H. Hsieh, L. Kui, G. Maurer, and J. Porter. 2020. Change in Pictures: Creating best practices in archiving ecological imagery for reuse. *Biodiversity Information Science and Standards* 4

Gries, C., R. Brown, M. Gastil-Buhl, S. Elmendorf, H. Garrett, M. Martin, G. Maurer, A. Nguyen, J. Porter, and T. Whiteaker. 2020. Going beyond the spreadsheet-developing Best Practices in 'long-tail' environmental data curation and publishing. *Earth and Space Science Open Archive (ESSOAr)*

Publications in preparation or review

Sala, O.E., G.E. Maurer. Unexpected indirect effects of field simulated drought offset direct climate-change impacts. (submitted)

Maurer, G.E., S. Elmendorf, N. Lyon, M. Downs, J. LaMontagne, E. Sokol, S. Earl, L. Dee, K. Barry, A. Chen, F. Isbell, J. Carey. Ten simple rules for team synthesis in ecological synthesis research. (in prep)

Maurer, G.E., J.V. Mills, E.J. Oerter, R.G. Amundson, L.N. Lammers. Measured and modeled soil carbon cycling in the Mojave desert: toward projected regional greenhouse gas budgets. (in prep)

Public datasets

Hernandez Rosales, B. and G.E. Maurer. 2022. Long-term climate indices (SPEI and scPDSI) derived from monthly meteorology data collected at USHCN stations in the northern Chihuahuan Desert of the United States, 1911-2021 ver 2. *Environmental Data Initiative*. <https://doi.org/10.6073/pasta/087795f6fac0f174397536ab27d50db6>

Hernandez Rosales, B. and G.E. Maurer. 2022. Derived SPEI and vapor pressure deficit for 15 NPP study sites on the Jornada Basin, 2013-ongoing ver 1. *Environmental Data Initiative*. <https://doi.org/10.6073/pasta/094b708fcc8bddca273010ddcde3dce1>

Maurer, G. E., A. Hallmark, R. F. Brown, O.E. Sala, and S. L. Collins. 2019. Derived data and code for: Sensitivity of primary production to precipitation across the United States (Ecology Letters). *figshare*. <https://doi.org/10.6084/m9.figshare.c.4780313.v1>

Maurer, G., L. N. Lammers, and R. Amundson. 2019. MojaveCarbon Climosequence. *HydroShare*. <http://www.hydroshare.org/resource/d01662d827f34170a5fd3589e468d06b>

Rudgers J., Y. Chung, G. Maurer, D. Moore, E. Muldavin, M. Litvak, S. Collins. 2017. Net primary production (NPP) and climate data from Sevilleta LTER core and control sites in desert grassland and shrubland ecosystems, 1999 - 2017. *Environmental Data Initiative*. <https://doi.org/10.6073/pasta/451fe8e98c663c728be3f85d3149e109>

Dissertation

Maurer, G.E. 2014. Ecosystem responses to seasonal snowpack variation in the western United States. The University of Utah (link)

Funded grants and fellowships

PI or Co-PI

NSF (DBI 2223103 subaward). “Collaborative Research: The Environmental Data Initiative - long-term availability of research data,” \$190,378.00 subaward. PI. September 2023-February 2026.

NSF (DEB 2326482). “LTREB: Long-term ecosystem responses to directional changes in precipitation amount and variability in an arid grassland,” \$670,000.00. Co-PI. September 2023-August 2028.

Senior Personnel

NSF (DEB 2425143). “LTER: Advancing ecological understanding of drylands through integrated research at the Jornada Basin (JRN-8),” \$7,649,997.00. March 2025-February 2031.

Other

UU Graduate School and Dept. of Biology travel funding (AGU Fall meeting), 2012

ASUU and Dept. of Biology travel funding (AGU Fall Meeting), 2011

UU Global Change and Sustainability Center Research Grant, 2011

NSF Research Experience for Undergraduates (publication above), 1999

Conference activity

Presentations & posters (first author or presenter only)

AGU Fall Meeting 2024 – Ecosystem Sensitivity to Precipitation Variability Along Intermediate Spatial Gradients in Vegetation and Soil Type (Poster)

iDigBio 2024 Digital Data Conference – Sustaining the future of science with open data at EDI (Talk)

AGU Fall Meeting 2023 – Supporting open science across the repository landscape (Talk and townhall discussion)

ESA Annual Meeting 2020 – Systematic variations in the contribution of rainfall-driven soil respiration pulses to soil carbon cycling in North American deserts (Poster)

AGU Fall Meeting 2018 – The contribution of ephemeral, moisture-driven soil respiration pulses to soil carbon cycling in the Mojave Desert (Poster)

AGU Fall Meeting 2017 – Sensitivity and asymmetry of NPP in response to climate variability across the conterminous United States (Talk)

AGU Fall Meeting 2017 – Modeled and measured carbon cycling in Mojave Desert soils: toward present and projected greenhouse gas budgets for arid regions (Poster)

AGU Fall Meeting 2015 – Seasonal precipitation and deep soil moisture recharge as competing drivers of carbon and water fluxes across a gradient of semi-arid ecosystems. (Poster)

AmeriFlux Principal Investigators Meeting 2015 – Seasonal and interannual variability in available water and coupled CO₂, H₂O, and energy fluxes along the New Mexico Elevation Gradient. (Poster)

AGU Fall Meeting 2014 – Soil carbon cycle ¹³C responses in the decade following bark beetle and stem girdling forest disturbance. (Poster)

AGU Fall Meeting 2013 – Dust and canopy effects on snowpack melt and ecosystem processes in a Utah subalpine forest. (Poster)

Fusion seminar (UU Biology Dept. Fall 2012) – The Weather Underground: The influence of seasonal snowcover on soil temperature and water content in the western U.S. (Talk)

AGU Fall Meeting 2012 – Sensitivity of soil temperature and soil moisture to seasonal snowpack variability in western U.S. mountain ecosystems. (Talk)

AGU Fall Meeting 2011 – Sources of variability in winter soil temperature moderation by mountain snowpacks. (Poster)

AGU Fall Meeting 2010 – Influence of dust deposition on snowpack melt rate and ecohydrological processes in a subalpine forest. (Talk)

Sessions & workshops organized

Ecological data synthesis: a primer on essential methods and team science (6-hour short course). Ecological Society of America Annual Meeting 2025. <https://lter.github.io/eco-data-synth-primer/>

Ecological data synthesis: a primer on essential methods (3-hour short course). Ecological Society of America Annual Meeting 2024. <https://events.rdmobile.com/Sessions/Details/2318667>

Linking traits, genomes, specimens, and images to LTER data. LTER Network All-Scientists Meeting 2022. Co-organized with Corinna Gries. <https://sched.co/1357I>

Emerging best-practices for publishing non-tabular, complex, and special-case ecological datasets. ESIP Summer Meeting 2021. Co-organized with Renée Brown and Corinna Gries. <https://sched.co/jMPC>

Teaching and mentoring

Instructor of record

Microbiology Lab, Biology 2310L, School of Math Science and Engineering, Central New Mexico Community College. Fall 2020 (online/asynchronous).

Biology Lab for Health Science Majors, Biology 1140L, School of Math, Science and Engineering, Central New Mexico Community College. Spring 2020

Microbiology Lab, Biology 2310L, School of Math Science and Engineering, Central New Mexico Community College. Spring 2020 (partial term).

Microbiology Lab, Biology 2192, School of Math Science and Engineering, Central New Mexico Community College. Spring 2019.

Biology Lab for Health Science Majors, Biology 1492, School of Math, Science, and Engineering, Central New Mexico Community College. Fall 2018 (2 sections).

Plant Identification, Red Butte Garden and Arboretum, University of Utah. 2007 & 2008.

Software & Data Carpentry workshops

Reproducible Data Analysis with Git, GitHub, and ggplot2 at Jornada Basin LTER and NMSU (in-person). Organizer and instructor. August 2025

Working with Geospatial Data in R at Jornada Basin LTER and NMSU (in-person). Organizer and instructor. June 2024

Working with Ecological Data in R at USDA-ARS Jornada Experimental Range Headquarters (in-person). Organizer and instructor. June 2023

Working with Geospatial Data in R at Jornada Basin LTER and NMSU (online). Organizer and instructor. November 2023

STEM Advancement Program Python workshop at New Mexico EPSCoR (online). Instructor. June 2022

Data carpentry for environmental scientists at Jornada Basin LTER and NMSU (online). Organizer and instructor. March 2022

Data Carpentry for Ecology at UNM Sevilleta Field Station. Instructor. June 2021 and 2022

Students mentored:

2023: Niko Valdez (Jornada LTER REU program)

2022: Kyle Gallant (Sevilleta REU), Brianda Hernandez-Rosales (EDI Data fellow)

2013: Lori Long (Undergraduate student, Univ. of Utah)

2012: Tasha Heilweil (High school student, Univ. of Utah)

2011: Richard Malyn, Davis Unruh (high school student, Univ. of Utah)

2010: Raili Taylor (undergraduate at Univ. of Utah)

Service to profession

Editorial Board member for *BioScience* **2024-present**

Co-chair, LTER Network Information Management Executive Committee **2021-2023** (member 2020-2023)

Associate editor for *Ecological Informatics* **2021-2023**

Reviewer for: *BioScience* (2), *Global Change Biology* (2), *Climatic Change* (1), *Ecological Applications* (1), *Oecologia* (1), *Plant Ecology* (2), *Trends in Ecology and Evolution* (1)

NSF Panelist

Relevant pre-Ph.D., non-academic, and contract work

Independent Contractor: March 2016–June 2016

Southwest Fire-Climate Partnership, U.S.F.S Rocky Mountain Research Station, Albuquerque, NM

Research Assistantships (multiple): December 2010–June 2014

Department of Biology, University of Utah, Salt Lake City, UT

Teaching Assistantships (multiple): August 2007–May 2012

Department of Biology, University of Utah, Salt Lake City, UT

Course Instructor (Plant Identification): May–July 2007 & 2008

Lifelong Learning, University of Utah, Salt Lake City, UT

_For a full listing, plus internship, volunteer, field, and technical experience please see <https://greg.pronghorns.net/resume.html>.

Professional affiliations

Member, American Geophysical Union (AGU)

Member, Ecological Society of America (ESA)