# Gregory E. Maurer

30 October 2025

Jornada Basin LTER
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

## 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

*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. Krofcheck, 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. Krofcheck, 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. $CO_2$ 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. Garritt, 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/9d4c8035 78c3fbcb45fc23f13124d052

## 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. Garritt, 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/087795f6fac0f174 397536ab27d50db6

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

## 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 $CO_2$, $H_2O$, and energy fluxes along the New Mexico Elevation Gradient. (Poster)

AGU Fall Meeting 2014 – Soil carbon cycle $^{13}C$ 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/

Leveraging partnerships across data providers to facilitate synthesis of biodiversity data. Living Data 2025. https://www.livingdata2025.com/sessions.html?session=6799373

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.

**Teaching assistant positions at University of Utah, Dept. of Biology:**

*Evolution and Diversity of Life*, Biology 2010, Drs. Lynn Bohs & Franz Goller. Spring 2012

*Biophysical Ecology*, Biology 5495, Dr. David Bowling. Fall 2011

*Ecosystem Ecology*, Biology 5490, Dr. David Bowling. Fall 2010

*Evolution and Diversity of Life*, Biology 2010, Drs. Lynn Bohs & David Carrier. Spring 2010

*Comparative Vertebrate Morphology*, Biology 3310, Dr. Colleen Farmer. Fall 2009

*Evolution and Diversity of Life*, Biology 2010, Drs. John Sperry and David Carrier. Spring 2009

*Ecosystem Ecology*, Biology 5490, Dr. David Bowling. Fall 2008

*Plant Ecology*, Biology 5460, Dr. James Ehleringer. Fall 2007

**Software & Data Carpentry workshops**

*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-present**

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

NSF Panelist

# Full academic and research experience

*Data Scientist and LTER Information Manager* **May 2019–present**
Jornada Basin Long-term Ecological Research Program, New Mexico State University, Las Cruces, NM

- Manage and publish research data collected by the Jornada Basin LTER program, in collaboration with scientists and data managers in the LTER network. Develop and manage a data science program that will generate new ecological research products, enhance existing investigations, and create analytical applications for scientific outreach.

*Part-time Instructor of Biology* **August 2018-present**
School of Math, Science, and Engineering, Central New Mexico Community College, Albuquerque, NM

- Teach Biology lab classes to first and second year students at a large, open-enrollment community college.

*Postdoctoral Scientist* **September 2016–May 2019**
Dept. of Environmental Science, Policy, and Management, Univ. of California Berkeley, Berkeley, CA

- Soil biogeochemistry research combining field measurements and ecosystem process modeling to create regional budgets of $CO_2$ and other soil trace gas fluxes under climate and land-cover change scenarios in the Mojave desert. Field instrumentation, modeling experiments (using DayCent), data QA and analysis, manuscript preparation.

*Independent Contractor:* **March 2016–June 2016**
U.S.F.S Rocky Mountain Research Station, Albuquerque, NM

- Literature review contributor in the Southwestern Fire-Climate Partnership.

*Postdoctoral Scientist:* **August 2014–September 2016**
Department of Biology, University of New Mexico, Albuquerque, NM

- Carbon cycle and ecohydrology research in Southwestern U.S. ecosystems using data from the New Mexico Elevation Gradient cluster of 8 AmeriFlux eddy covariance towers. Data analysis, presentations, and manuscript preparation. Data manager and QA/QC lead for this AmeriFlux cluster.

*Research Assistant:* **July 2012–June 2014**
Department of Biology, University of Utah, Salt Lake City, UT

- Carbon concentration and stable isotope analysis of soil and soil respiration samples, data analysis, and writing for a DOE funded project on belowground carbon cycling in beetle-impacted sub-alpine forest ecosystems.

*Research Assistant:* **December 2010–June 2011**
Department of Biology, University of Utah, Salt Lake City, UT

- Method development, field collection, and laboratory analysis (major ions in snow) for a study of winter atmospheric deposition in the Salt Lake City area. Study occurred in collaboration with the Persistent Cold Air Pool study by the UU Dept. of Atmospheric Sciences (Winter 2010–11).

*Field Botanist:* **Summers 2007 & 2008**
Cottonwood Canyons Foundation, Salt Lake City, UT

- Conducted surveys for threatened, endangered, and sensitive plant species in the central Wasatch Mountains. Coordinated efforts with and provided data to the Uinta-Wasatch-Cache National Forest and Utah Native Plant Society. (Summers only)

*Field Botanist:* **Summers 2006 & 2007**
Red Butte Garden and Arboretum, Salt Lake City, UT

- Lead collector for Red Butte Garden's team in the Seeds of Success project (BLM/Millenium Seed Bank). Researched native plant species, located populations, then made large seed collections utilizing volunteer assistance. Coordinated efforts with regional botanists and land managers.

*GIS Analyst:* **October 2006–May 2007**
DIGIT Lab, Department of Geography, University of Utah, Salt Lake City, UT

- Conducted spatial data analysis, GIS application development, and provided technical support for University of Utah Geography Dept. projects and other public or private sector clients. Maintained the University of Utah Spatial Database.

*Port Sampler:* **June 2004–September 2004**
Marine Resources Program, Oregon Department of Fish and Wildlife, Salem, OR

- Ocean Recreational Boat Survey. Conducted boat counts and interviews with returning fishermen to determine fishing effort, target locations and species, catch and release rates. Inspected catches, collecting hatchery tags and biological data/samples from species of interest. Made weekly reports to Newport office.

## Internships

*The Nature Conservancy*, Conservation GIS intern, Salt Lake City, UT, 2006

*Alaska Bird Observatory*, Nesting field study intern, Fairbanks, AK, 2001

## Volunteer

*Wasatch Community Gardens*, Salt Lake City, UT, 2010–2014

*Lowell-Bennion Community Service Center* (Univ. of Utah), 2006–2007

*Red Butte Garden and Arboretum*, Salt Lake City, UT, 2005–2007

*Swaner Nature Preserve*, Kimball Junction, UT, 2005

*Columbia River Estuary Study Taskforce*, Astoria, OR, 2004

## Computing skills

(**Bold** indicates proficiency)

*Applications*: **MS Office**, **QGIS**, **ArcGIS**, LaTeX, PostgreSQL,

*Programming*: **Python**, **R**, **MATLAB**, JavaScript

*Web*: **HTML & CSS**, WordPress, website administration

*Operating systems*: **Unix/Linux**, **Windows**, **Mac OSX**

*Other*: **git/GitHub**, **literate programming** (jupyter notebooks, RMarkdown), basic sysadmin skills, basic server/cloud provisioning with ansible

## Technical, field, and laboratory skills

Plant/soil/ecosystem $CO_2$ & $H_20$ exchange measurements (Li-Cor 6200, 6400, 7000, 7200, 7500)

Eddy covariance instrumentation and data QA/QC

Soil hydrological and ecosystem process modeling with HYDRUS and DayCent

Analysis of gridded climate and carbon cycle modeling products (PRISM, MsTMIP)

Stable isotope and nutrient analysis of plants, soils, waters, and gases

$CO_2$ to graphite reduction for AMS analysis of $^{14}C$

Major ion analysis of water/snow samples

Datalogger and environmental sensor network design/maintenance (Esp. with Campbell dataloggers)

Weather station setup, maintenance, and quality assurance

Wireless radio and internet networks (Sierra Wireless modems, MaxStream and Digi Xbee radios)

Plant identification in western North America

Avalanche safety (Level 1)

## Professional affiliations

Member, American Geophysical Union (AGU)

Member, Ecological Society of America (ESA)