Erica L. McCormick

PhD Candidate
Earth System Science, Doerr School of Sustainability, Stanford University
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EDUCATION

Stanford University Fall 2022 - Present
Ph.D. Candidate, Earth System Science

University of Texas at Austin 2016-2020
B.S. Environmental Science (Geology)

HONORS & AWARDS

Diversifying Academia, Recruiting Excellence (DARE) Fellow, *Stanford* 2024-2026
National Science Foundation Graduate Research Fellowship, *NSF* 2022-2025
GCA Zone VI Fellowship in Urban Forestry, Garden Club of America, *Garden Club of America* 2019
Plan II Skaaren Climate Fellowship, *College of Liberal Arts, UT Austin* 2019
Plan II Travel Grant for Research *College of Liberal Arts, UT Austin* 2018
Undergraduate Research Grant, *College of Liberal Arts, UT Austin* 2018

PEER-REVIEWED PUBLICATIONS

Google Scholar

6. A.G. Konings, K. Rao, **E.L. McCormick**, A.T. Trugman, A.P. Williams, N.S. Diffenbaugh, M. Yebra, M. Zhao (2024). Species cover explains only half of spatial variability in plant water sensitivity. *Global Change Biology, 30*(7), e17425. [Link]

5. W.J. Hahm, D.A. Lapides, D.M. Rempe, **E.L. McCormick**, D.N. Dralle (2022). The age of evapotranspiration: lower-bound constraints from distributed water fluxes across the continental United States. *Water Resources Research, 58*(10), e2022WR032961. [Link]

4. **E.L. McCormick**, D.N. Dralle, W.J. Hahm, A.K. Tune, L. Schmidt, K.D. Chadwick, D.M. Rempe. (2021) Evidence for widespread woody plant use of water stored in bedrock. *Nature, 597*(7875), 225-229. [Link]

3. D.N. Dralle, W.J. Hahm, K.D. Chadwick, **E.L. McCormick**, D. M. Rempe. (2021) Accounting for snow in the estimation of root-zone water storage capacity from precipitation and evapotranspiration fluxes. *Hydrology and Earth System Sciences, 25*(5), 2861-2867. [Link]

2. Matheny, A.M., P. Marchetto, J. Powell, A. Rechner, J.Y. Chuah, **E. L. McCormick**, S. Pierce (2019) LEAF: Logger for Ecological and Atmospheric Factors. *HardwareX, 6*, e00079. [Link]

1. Mursinna, A.R., **E. L. McCormick**, K. Van Horn, L. Sartin, A. Matheny (2018) Plant hydraulic trait covariation: a global meta-analysis to reduce degrees of freedom in trait-based hydrologic models. *Forests, 9*(8), 446. (Cover Article) [Link]

PAPERS IN PROGRESS

2. M. Zhao, **E. L. McCormick**, G. A, A. G. Konings, B. Li. Substantial root-zone water storage capacity observed by GRACE and GRACE/FO. (In Revision). *Hydrology and Earth System Sciences*.

1. D.M. Rempe*, **E.L. McCormick***, W.J. Hahm, G.G. Persad, C. Cummins, D.A. Lapides, K.D. Chadwick, D.N. Dralle (In Revision). Resilience of woody ecosystems to precipitation variability. *co-first author [Link]

PACKAGES, DATASETS, & CODE

WaterPyk: A Python package to download and analyze hydrological timeseries at any site, polygon, or watershed leveraging the Google Earth Engine cloud computing platform. [Link]

E.L. McCormick, D. Dralle, W.J. Hahm, A. Tune, L. Schmidt, K.D. Chadwick, D.M. Rempe (2021). Dataset for "Evidence for widespread woody plant use of water stored in bedrock." *CUAHSI (Consortium of Universities for the Advancement of Hydrologic Sciences, Inc) HydroShare*. [Link]

E.L. McCormick, D. Dralle, W.J. Hahm, A. Tune, L. Schmidt, K.D. Chadwick, D.M. Rempe. Code for manuscript: "Evidence for widespread woody plant use of water stored in bedrock." (v1). *Zenodo.* [Link]

SERVICE

Mentor, Science Small Groups (Stanford) 2024
- Weekly mentorship of community college students exploring the scientific process

Served on student committee for Freshwater Faculty Search (Stanford) 2024

Wellness Liaison (Earth System Science Department) 2024-Present
- Connect community with mental health resources at Stanford and plan relevant events
- Meet with department leaders and administration to discuss student feedback and needs

Invited panelist for 'Developing Effective Mentoring Relationships' webinar (CUAHSI) 2023

Invited panelist for 'Professional Development for Env. Scientists' course (UT Austin) 2021, 2022
- Provide perspective and tips about graduate school for undergraduates

Volunteer pen-pal (Letters to a Pre-Scientist) 2022, 2023, 2024
- Correspond throughout the academic year (via hand-written letters) to a middle school student in a US low-income community about life in graduate school and as a scientist

Full-time gardener & caretaker for special needs adults (Camphill Callan, Ireland) Jan - March 2016

PRE-PHD RESEARCH EXPERIENCE

Research Engineering/Scientist Assistant (Full Time), UT Austin 2021-2022

Supervisor: Daniella Rempe, Vadose Zone Hydrology Lab
- Combined multiple high-resolution datasets across CONUS to infer belowground properties not directly observable by remote sensing or in-situ measurements
- Developed instructional material about large-scale data processing and cloud computing techniques for undergraduate courses and workshops

Oak Ridge ORISE Research Fellow, US Forest Service Summer 2022

Supervisor: David Dralle

- Forecasted hydrologic risk factors impacting recreational desirability of California's National Forests using visitor cell-phone and remote sensing datasets

Undergraduate Researcher, Jackson School of Geosciences, UT Austin

Supervisor: Daniella Rempe, Vadose Zone Hydrology Lab 2019-2020

- Compiled global meta-analysis on vegetation use of bedrock moisture for evapotranspiration
- Measured bedrock water content in the field using nuclear magnetic resonance and neutron probe

Summer Research Intern, US Forest Service 2020

Supervisor: David Dralle

- Used CONUS-scale remote sensing data products and Google Earth Engine to evaluate the importance of forest root depth distributions for forest and watershed management

Undergraduate Researcher, Jackson School of Geosciences, UT Austin

Supervisor: Ashley Matheny, Ecohydrology Lab 2018-2020

- Updated physics-based plant hydraulics model for compatibility with new in-situ vegetation datasets
- Conducted statistical analysis to evaluate degrees of freedom in plant hydraulic trait parameterization

Undergraduate Researcher, Department of Geography, UT Austin 2017-2020

Supervisors: Timothy Beach and Sara Eshleman, Geoarchaeology & Soil Lab

- Performed and refined soil chemical analyses to measure organic carbon, nitrogen, phosphorous, grain size, and magnetic susceptibility
- Conducted one month of fieldwork in remote Belizean rainforest for cave exploration and archaeologically-informed vegetation and soil sampling

PRESENTATIONS

Computational Methods in Water Research (CMWR), Tuscon 2024
"Rock moisture frequently contributes to daily ET"

Hydro90 Conference, China, Invited (virtual) 2023
"Rock moisture & its implications for ecosystem resilience to precipitation variability"

Joint-Hydrology Seminar, Stanford University 2023
"Water scarcity & abundance: plant water uptake from fractured rock, drought, & extreme wet events"

American Geophysical Union Fall Meeting, Chicago 2022
"Resilience of California's Woody Ecosystems to Precipitation Variability"

American Geophysical Union Fall Meeting, New Orleans, Invited 2021
"Weathered bedrock commonly supplies water to woody plants"

University of Wisconsin, Madison, Zahasky Group Seminar (Virtual) 2021
Widespread woody plant use of bedrock water storage

Water, Climate, and Energy Seminar, UT Austin 2021
"Widespread woody plant use of bedrock water storage"

TEACHING EXPERIENCE

GEO 371/391 Vadose Zone Hydrology (UT Austin) Spring 2021
Teaching Assistant for Dr Daniella Rempe

- Enrollment: 18 students (9 grad, 9 undergrad)
- Prepared and conducted lecture on Hydrus 1D (soil modeling) software and Google Earth Engine
- Assisted with office hours and preparation of instructional material

TC 358 Law and Ethics of Climate Change (UT Austin) Fall 2020
Teaching Assistant for Prof Amon Burton, JD

- Enrollment: 18 undergraduates
- Designed new course content on hydrology and climate change
- Prepared and conducted lecture on hydrogeology issues of central TX
- Managed student meetings, visiting speakers, field trips, and grading

MENTORSHIP

Undergraduate Mentees

- Lillian Sanders (Stanford) Fall 2023 - Present
- Bhu Kongtaveelert (Stanford) Summer 2023

PRESS

Science & Vie Magazine (France) Dec 2021
"Les Arbres Boivent De L'eau Dans Les Roches"

Scientific American Dec 2021
"Trees Drill into Deep Bedrock for Water Surprisingly Often" by By Tess Joosse [Link]

AGU Ecohydrology Nov 2021
"Meet A Leaf" blog profile [Link]

Eos Magazine Oct 2021
"Thirsty Plants Pull Water from Bedrock" by Katherine Kornei [Link]

UT News 2021
"Water in Bedrock is Sustaining Trees Across Country" by Monica Kortsha [Link]

Simon Fraser University News 2021
"Could the Water in Bedrock Save our Forest Ecosystems from Climate Change?" [Link]