# Erica L. McCormick

PhD Student
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## EDUCATION

**Stanford University** Fall 2022 - Present
Ph.D. Earth System Science (Qualifying exam, Spring 2024)

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

## HONORS & AWARDS

National Science Foundation Graduate Research Fellowship, *NSF* 2022
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 (151 citations as of 4/24)

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. A.G. Konings, K. Rao, **E.L. McCormick**, A.T. Trugman, A.P. Williams, N.S. Diffenbaugh, M. Yebra, M. Zhao (In Revision) Species cover explains only half of spatial variability in plant water sensitivity. *Global Change Biology.*

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

**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
- 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

**Volunteer bike mechanic** (Yellow Bike Project, Austin, TX) 2020-2022

**Volunteer bedtime helper** (Helping Hand Home for Children, Austin, TX) 2017-2018

**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

**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]