

Sophie Ruehr

Department of Global Ecology
Carnegie Institution at Stanford, CA

Website: sruehr.github.io **Email:** sruehr@carnegiescience.edu

ACADEMIC APPOINTMENTS

Max Plank-Caltech-Carnegie-Columbia MC³ 4 Earth Center

2025- Post-Doctoral Fellow in Land Surface Modeling

University of California, Berkeley

2025 Post-Doctoral Researcher, Dept. of Environmental Science, Policy & Management

EDUCATION

Ph.D.	University of California Berkeley	Environmental Science, Policy & Management	2025
B.Sc.	Yale University	Geology & Geophysics	2018

RESEARCH INTERESTS

Water and carbon cycle science, terrestrial ecosystem analysis and observation, near-surface and satellite remote sensing, sensor development, ecohydrology, sustainable food systems, water management, land-atmosphere interactions, climate resilience, inclusive research methods

PROFESSIONAL EXPERIENCE

Provincetown Independent, MA, USA

2019-2020 Newspaper Staff Reporter

University of the South Pacific, Port Vila, Vanuatu

2018-2019 Yale University Huang Fellow

Woods Hole Oceanographic Institution, MA, USA

2017 Summer Student Fellow

Provincetown Banner, MA, USA

2016 Newspaper Staff Reporter

HONORS & AWARDS

Max Plank-Caltech-Carnegie-Columbia MC³ 4 Earth Center Postdoctoral Fellowship, 2025-present

NASA Future Investigators in Earth and Space Science and Technology Fellowship, 2022-2025

Achievement Rewards for College Scientists Fellowship, 2020-2022

National Science Foundation Graduate Research Fellowship Program Honorable Mention, 2022

New England Newspaper Association, First Place: Science/Technology Reporting, 2021

New England Newspaper Association, First Place: Health Reporting, 2021

Yale University Parker Huang Undergraduate Travel Fellowship, 2018-2019

Yale University Dept. of Geology & Geophysics Hammer Prize, 2018

Yale University Karen Von Damm 1977 Fellowship, 2017

Woods Hole Oceanographic Institution Summer Student Fellowship, 2017

GRANTS & COMPETITIVE FUNDING AWARDS (\$450,000 total)

2025-	Max Plank-Caltech-Carnegie-Columbia MC ³ 4 Earth Center: Postdoctoral Fellowship in Land-Surface Modeling (\$82,500 annually, up to 4 years)
2025-2026	University of California Berkeley Chancellor's Advisory Committee: Improving field safety and inclusion in ESPM (\$54,000)
2025-2026	University of California Berkeley Be Smart About Safety Grant: Field safety through improved emergency communications and training (\$25,000)
2022-2025	NASA FINESST (Future Investigators in NASA Earth and Space Science and Technology): Quantifying ecosystem reliance on groundwater, Co-PI Ruehr (\$150,000)
2022	FLUXNET Early Career Secondment: Quantifying ecosystem reliance on groundwater with eddy covariance and sap flow data (\$7,400)
2020	University of California Berkeley Carol Baird Fieldwork Grant: Using hyperspectral imagery at Sagehen Experimental Forest to quantify ecosystem reliance on groundwater (\$33,000)
2020	Achievement Rewards for College Scientists Graduate Student Fellowship: Graduate funding for 2 years (\$100,000)
2018	Yale University Parker Huang Undergraduate Travel Fellowship: Oral history in Vanuatu to support paleoclimate research (\$36,000)
2017	Yale University Karen Von Damm 1977 Fellowship: In support of senior honors thesis field research in Lanzhou, China (\$5,000)
2017	Woods Hole Oceanographic Institution Summer Student Fellowship: Hurricane paleoclimatology research (\$8,000)

SERVICE

Committees & management

UC Berkeley Dept. ESPM Field Safety Committee, 2024-2025

UC Berkeley College of Natural Resources LGBTQ+ Coalition, 2020-2023

AmeriFlux Diversity, Equity & Inclusion Committee, 2020-2024

UC Berkeley Dept. ESPM Graduate Diversity Council, 2020-2024

Reviewing

Regular reviewer for Nature Communications, PNAS, Science Advances, One Earth, Geophysical Research Letters, Agricultural & Forest Meteorology, Nature Communications Earth & Environment, Hydrology, Earth's Future, AGU Advances, & Journal of Arid Environments

MENTORING

Current

Eden Gonzalez, UC Berkeley undergraduate student, 2023-

Jackson Coldiron, UC Santa Barbara master's student, 2024-

Past

Adam Rashid, UC Berkeley undergraduate student (now: MIT PhD student, 2023-2024)

Megan Hur, UC Berkeley undergraduate student (now: NASA Goddard research assistant), 2022-2024

Tyler Goldstein, UC Berkeley undergraduate (now: UC Berkeley science communications), 2021-2023

TEACHING***Guest lectures***

- 2025 “Land Surface Modeling” in ESPM 111, Carbon Cycle Dynamics, UC Berkeley
 2024 “Remote Sensing of the Biosphere” in EPS 251, Ecosystem Science, UC Berkeley

Courses

- 2024 Graduate Student Instructor, Ecosystem Science, led by Prof. Dennis Baldocchi

Centers

- 2020-2024 Data Consultant for R, Python, Google Earth Engine, UC Berkeley D-Lab

PUBLICATIONS (see [Google Scholar Profile](#) for updates)***Published (2015-present)***

- **Ruehr S**, Gerlein-Safdi C, Falco N, Seibert P, Chou C, Albert L, Keenan TF. 2024. Quantifying seasonal and diurnal cycles of solar-induced fluorescence. *Geophysical Research Letters*, 51, 14. 10.1029/2023GL107429.
- **Ruehr S**, Giroto G, Verfaillie J, Baldocchi D, Cabon A, Keenan TF. 2023. Ecosystem groundwater use enhances carbon sinks in a semi-arid oak savanna. *Agricultural & Forest Meteorology*, 342, 109725. 10.1016/j.agrformet.2023.109725.
- **Ruehr S**, Keenan TF, Williams C, Zhou Y, Lu X, Bastos A, Canadell P, Prentice IC, Sitch S, Terrer C. 2023. Evidence and attribution of the enhanced land carbon sink. *Nature Reviews Earth & Environment*, 4, 518-534. 10.1038/s43017-023-00456-3.
- Massoud EC, Andrews L, Reichle R, Molod A, Park J, **Ruehr S**, Giroto M. 2022. Seasonal forecasting skill for the High Mountain Asia region in the Goddard Earth Observing System. *Earth System Dynamics*, 14, 147–171. 10.5194/esd-14-147-2023.
- **Ruehr S**. 2021. Beyond the vulnerability/resilience dichotomy: Perceptions of and responses to the climate crisis on Emau, Vanuatu. *Island Studies Journal*, 10.24043/isj.151.
- Massoud EC, Andrews L, Reichle R, Molod A, Park J, **Ruehr S**, Giroto M. 2022. Seasonal forecasting skill for the High Mountain Asia region in the Goddard Earth Observing System. *Earth System Dynamics*, 14, 147–171. 10.5194/esd-14-147-2023.
- **Ruehr S**. 2021. Beyond the vulnerability/resilience dichotomy: Perceptions of and responses to the climate crisis on Emau, Vanuatu. *Island Studies Journal*, 10.24043/isj.151.
- Ruehr S, Lee X, Smith R, Li X, Xu Z, Liu S, Yang X, Zhou Y. 2020. A mechanistic investigation of the oasis effect in the Zhangye cropland in semiarid western China. *Journal of Arid Environments*, 176, 104120. 10.1016/j.jaridenv.2020.104120.
- Espeland M et al. [14 authors incl. **Ruehr S**]. 2015. Ancient Neotropical origin and recent recolonisation: Phylogeny, biogeography and diversification of the Riodinidae (Lepidoptera: Papilionoidea). *Molecular Phylogenetic Evolution*, 93, 296-306. 10.1016/j.ympev.2015.08.006.

In review

- **Ruehr S**, Bassiouni M, Kang Y, Socolar Y, Magney T, Keenan TF. Crop rotation enhances agricultural water use efficiency.
- Friedlingstein P et al [20 authors incl. **Ruehr S**]. The state of land carbon sinks.
- Pierrat ZA, Gustine RN, Boser A, **Ruehr S**, Lee CM, Reager JT, Cawse-Nicholson K. Human contributions to evapotranspiration mitigate swings in dry to wet year transitions.
- Rao MP et al. [29 authors incl. **Ruehr S**]. Atmospheric aridity decouples carbon assimilation and growth in temperate deciduous oaks.

In preparation

- **Ruehr S**, Dukes J, Rosa L. Irrigation infrastructure and multi-cropping can buffer rainfall extremes in South American agricultural landscapes. (Target journal: *Nature Sustainability*).
- **Ruehr S**, Pierrat Z, Parazoo N, Keenan TF. Harnessing solar-induced fluorescence for agricultural research and management. (Target journal: *Environmental Research Letters*).
- Cabiyo B, **Ruehr S**, Arora T, Nolan CJ, Kueppers L, Field C. The durability of forests in a changing climate. (Target journal: *Nature*).

Publications from consulting

- Rutkove SB et al. [6 authors incl. **Ruehr S**]. 2022. Design and pilot testing of a 26-gauge impedance-electromyography (iEMG) needle in wild type and ALS mice. *Nerve & Muscle*, 65, 6. 10.1002/mus.27551.
- Chin A, **Ruehr S**, Tarulli A, Rutkove SB. 2007. Saline-saturated Balsa Wood as a Testing Medium for Rotational Electrical Impedance Myography. *IFMBE Proceedings*, 17, 272-275. 10.1007/978-3-540-73841-1_72.

PRESENTATIONS***First author oral presentations***

- Ecohydrology insights for water resource management in agroecosystems (**invited**), December 2025, American Geophysical Union Fall Conference, Frontiers in Ecohydrology.
- Understanding and supporting resilient ecosystems (**invited**), August 2025, Lawrence Livermore National Lab, Livermore, CA.
- Emerging satellite products unveil cropland water use efficiency trends and drivers in California's Central Valley, December 2024, American Geophysical Fall Meeting, Washington DC, USA.
- Evidence and attribution of the land carbon sink's historic enhancement (**invited**), October 2023, Max-Planck Institute for Biogeochemistry, Jena, Germany.
- Groundwater drought decreases carbon fixation in a semi-arid oak savannah, September 2023, CREAM, Barcelona, Spain.
- Hyperspectral imagery illuminates drivers of solar-induced fluorescence across landscapes, December 2022, American Geophysical Fall Meeting, Washington DC, USA.
- Groundwater drought decreases carbon fixation in a semi-arid oak savannah, December 2022, American Geophysical Fall Meeting, Chicago IL, USA.

- Quantifying ecosystem reliance on groundwater, December 2021, American Geophysical Fall Meeting, New Orleans LA, USA.
- Carbon emissions and offsets: Global and local research (**invited**), August 2021, Distinguished Speaker at ARCS Forward National Speaker Series.
- Incorporating stakeholder feedback in paleoclimatology research, 2019, Woods Hole Oceanographic Institution MA, USA.
- Tracing ancient cyclones: paleoclimate, oral history & climate futures (**invited**), November 2018, University of the South Pacific Emalus Campus, Vanuatu.
- The oasis effect: evaluating intrinsic biophysical mechanism theory and its implications for sustainable water management in Zhangye, Gansu, China, May 2018, Yale University CT, USA.
- Intrinsic Biophysical Mechanism Theory & the Oasis Effect (**invited**), March 2018, Key Laboratory of West China's Environmental System, Lanzhou University, Gansu, China.
- Exploring the Oasis Effect with Land Surface Modeling (**invited**), March 2018, School of Geography, Beijing Normal University, Beijing, China.

First author posters

- Evidence and attribution of the land carbon sink's historic enhancement, December 2023, American Geophysical Union Fall Meeting, Chicago IL, USA.
- Picturing SIF: field readiness and initial results from a novel SIF imaging instrument, December 2021, American Geophysical Fall Meeting, New Orleans LA, USA.
- Latent heat drives cooling over oases, December 2020, American Geophysical Fall Meeting.
- Newfound aspects of ancient hurricanes: reconstructing storm intensity and sediment deposition dynamics in northeastern coastal ponds, August 2017, Woods Hole Oceanographic Institution, MA, USA.

MEDIA & OUTREACH

Science communication

2023	FLUXNET blog
2022	Keenan Group TikTok
2022	AmeriFlux 25 years data visualization tool
2022	Berkeley Science Review
2019-2020	Provincetown Independent
2019	InsideClimate News
2010	WOMR Cape Cod's Outermost Radio
2016, 2018	Provincetown Banner

Press

2023	Ask MIT Climate
2023	Phys.org

WORKSHOPS

2025	Identity-Based Risks in Field Work, UC Berkeley, CA
------	---

2024	Center for Climate Sciences Summer School, NASA Jet Propulsion Lab, Pasadena, CA
2024	Spring Teaching Conference, UC Berkeley, CA
2024	FieldFutures Harassment Prevention Training, UC Berkeley, CA
2024	DroneCamp, CSU Monterey Bay, CA
2022	Field Safety Workshop, AmeriFlux
2022	FluxCourse, AmeriFlux at Niwot Ridge Long-term Ecological Research Program, CO