Sophie Ruehr

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ACADEMIC APPOINTMENTS

Carnegie Institution for Science

2025-	Postdoctoral Fellow in Land-Surface Modeling Biosphere Sciences & Engineering Division	Stanford, CA

EDUCATION

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

RESEARCH INTERESTS

Terrestrial ecosystems, climate solutions, sustainable agriculture, AI for Earth data, drought resilience, near-surface & satellite remote sensing, sensor development, ecohydrology, water management, land-atmosphere interactions, policy implications

PROFESSIONAL EXPERIENCE

Provincetown Independent

2019-2020	Newspaper Staff Reporter	Provincetown, MA USA

University of the South Pacific

2018-2019	Yale University Huang Fellow	Port Vila, Vanuatu

Woods Hole Oceanographic Institution

2017	Summer Student Fellow	Woods Hole, MA USA

Provincetown Banner

2016	Newspaper Staff Reporter	Provincetown, MA USA

HONORS & AWARDS

Max Plank-Caltech-Carnegie-Columbia MC^3 4 Earth Center Post-Doctoral 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 & COMPETITVE 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 groundwater use ($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**, Bassiouni M, Kang Y, Socolar Y, Magney T, Keenan TF. 2025. Crop diversification improves water-use efficiency and regional water sustainability. *Environmental Research Letters,* 20, 114062. 10.1088/1748-9326/ae15a9.
- **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**, 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.
- **Ruehr S**, Girotto 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.
- Massoud EC, Andrews L, Reichle R, Molod A, Park J, **Ruehr S**, Girotto 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

- 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*).
- Dannenberg M, Barnes M, Biederman J, Johnston M, Meerdink S, **Ruehr S**, Scott R, Smith W, Williams P. Improved estimation of the interannual variability of dryland carbon and water fluxes. (Target journal: *Scientific Data*).

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 Mediumfor 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, CREAF, 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, 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 & OTUREACH

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