Marianne Cowherd, Ph.D.

Assistant Professor, Department of Earth Sciences
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APPOINTMENTS

Assistant Professor, Department of Earth Sciences — 2025 – present
Montana State University — Bozeman, MT

Affiliate Researcher, Earth and Environmental Sciences Area — 2023 – present
Lawrence Berkeley National Laboratory — Berkeley, CA

Affiliate Researcher — 2022 – present
Central Sierra Snow Laboratory — Soda Springs, CA

Postdoctoral Scholar, Environmental Science, Policy, and Management — 2025
University of California, Berkeley — Berkeley, CA

Visiting Scientist, Earth Systems Analysis & Modeling — 2022
Pacific Northwest National Laboratory — Richland, WA

US Department of Energy Computational Sciences Graduate Fellow — 2021 – 2025
University of California, Berkeley — Berkeley, CA

Graduate Researcher, Environmental Science, Policy, and Management — 2020 – 2025
University of California, Berkeley — Berkeley, CA

EDUCATION

Ph.D., Environmental Science, Policy, and Management — 2025
University of California, Berkeley

M.S., Environmental Engineering — 2020
Stanford University

B.S., Environmental Systems Engineering — 2019
Stanford University

PEER-REVIEWED JOURNAL PUBLICATIONS

Underlined name indicates supervised student

5. **Cowherd, M.**, Mital, U., Rahimi, S., Girotto, M., Schwartz, A., and Feldman, D. Climate change-resilient snowpack estimation in the Western United States. *Communications Earth & Environment*, 2024.

4. Girotto, M., Formetta, G., Azimi, S., Bachand, C., **Cowherd, M.**, De Lannoy, G., Lievens, H., Modanesi, S., Raleigh, M.S., Rigon, R., and Massari, C. Identifying snowfall elevation gradients by assimilating satellite-based snow depth observations. *Science of the Total Environment*, 2024.

3. **Cowherd, M.**, Leung, L.R., and Girotto, M. Evolution of global snow drought characteristics from 1850 to 2100. *Environmental Research Letters*, 2023.

2. **Cowherd, M.**, Egan, G., Fringer, O., and Monismith, S. Wave phase-decomposed velocity profile observations in a shallow estuary. *Geophysical Research Letters*, 2021.

1. Egan, G., **Cowherd, M.**, Fringer, O., and Monismith, S. Observations of near-bed shear stress in a

shallow, wave- and current-driven flow. *Journal of Geophysical Research: Oceans*, 2019.

Submitted, in review, or in revision:

Cowherd, M., Schwartz, A., Marks, J., Brandt, G., Kim, L., Collins, B., Stephens, S., and Girotto, M. Low severity fire retains snow longer in a California megafire. *in revision*

Cowherd, M., Rahimi, S., Vargas Zeppetello, L., Hall, A., and Girotto, M. Surface and atmosphere drivers of snow drought are topography-dependent. *in review*

Gibson, L., **Cowherd, M.**, Aiken, A., Rudisill, W., Riihimaki, L., and Feldman, D. The dual role of snowfall in impacting surface albedo and spring snowmelt in the Upper Colorado River Basin. *in revision*

Schwartz, A. **Cowherd, M.**, McGurk, B., Mason, M., Riker-Coleman, K., Zutter, B., and Lewis, G. Modernization of the Central Sierra Snow Laboratory: A new chapter in a storied existence. *in review*

GRANTS AND AWARDS

New Faculty Equipment Grant	2026
NSF-EAR Postdoctoral Fellowship (declined)	2025-2027
ELLIIT Machine Learning for Climate Science visiting scholar, Sweden	2024
Alpine Avalanche Rescue Foundation Training Scholarship	2024
UC Berkeley Graduate Division Conference Travel Grant	2024 (x2)
Peder Sather Grant (Co-I)	2023-2025
H2H8 Undergraduate Support Grant	2023
H2H8 Graduate Student Explorer Grant	2022
NCAR University Small Request	2022
US Department of Energy Computational Science Graduate Fellowship	2021-2025
UC Berkeley Sponsored Programs for Undergraduate Research	2021-2023
UC Berkeley Forestry Research Summer Award	2021
UC Berkeley Undergraduate Mentoring Fellowship	2021
UC Berkeley Graduate Remote Instruction Innovation Fellowship	2020-2021
UC Berkeley ESPM Starter Grant	2020
UC Berkeley STEM*FYI Technology Grant	2020
NSF GRFP honorable mention	2019
Stanford Undergraduate Conference Grant	2019
Stanford Undergraduate Summer Research Fellowship	2018
Stanford Woods Institute Forum for Undergraduate Environmental Leadership	2018

INVITED SEMINARS

2025, Aug	S3 wind and atmospheric boundary layer research group, online
2025, Apr	Berkeley Atmospheric Sciences Center Seminar, University of California, Berkeley
2025, Feb	Earth Sciences Seminar, Montana State University
2024, Nov	California Cooperative Snow Surveys Meeting, Auburn, California
2024, Oct	Machine Learning for Climate Science Series, Linköping University, Sweden
2024, Sep	GeoHyd Seminar, University of Oslo, Norway
2023, Nov	Outer Coast College, Sitka, Alaska

2022, Sep Satellite Data for Hydrological Applications Seminar, virtual

CONFERENCES

Underlined name indicates student or postdoc advisee.

17. Yu, Felix., Feldman, D., **Cowherd, M**. et al. "Trojan Horse Snowfall: How dust in snowfall produces delayed, but significant impacts across the Upper Colorado River Basin." American Geophysical Union, New Orleans, LA, December 2025. (poster)

16. **Cowherd, M.**, et al. "Quantifying snow information in a changing climate." American Geophysical Union, New Orleans, LA, December 2025. (poster)

15. **Cowherd, M.**, Gutmann, E., and Feldman, D., "Snow bedforms observed with terrestrial scanning lidar." Joint ARM User Facility and ASR PI Meeting, Rockville, MD, March 2025. (poster)

14. **Cowherd, M.**, Gibson, L., Feldman, D., Aiken, A., Riihimaki, L., Telg, H., Hodshire, A., Levin, E., and McMeeking, G., "Inferring wet deposition (of dust)." Joint ARM User Facility and ASR PI Meeting, Rockville, MD, March 2025. (talk)

13. **Cowherd, M.**, Mital, U., Rahimi, S., Girotto, M, Schwartz, A., and Feldman, D., "Climate-resilient snowpack estimation: measurements and models in a changed future." American Geophysical Union, Washington, D.C., December 2024. (invited talk)

12. **Cowherd, M.**, Gutmann, E., Kochanski, K., and Feldman, D., "Snow bedforms observed with terrestrial scanning lidar." American Geophysical Union, Washington, D.C., December 2024 (poster)

11. **Cowherd, M.**, Mital, U., Rahimi, S., Girotto, M, Schwartz, A., and Feldman, D., "Climate-resilient snowpack estimation with machine learning." NCAR-CISL International Computing in the Atmospheric Sciences Symposium, Stresa, Italy, September 2024. (talk)

10. **Cowherd, M.**, Schwartz, A., Marks, J., Brandt, G., Kim, L., Collins, B., Stephens, S., and Girotto, M., "Post-fire accumulation and melt in the Caldor Fire." Western Snow Conference, Corvallis, OR, April 2024. (talk)

9. **Cowherd, M.**, Rahimi, S., Girotto, M., "Predicting spatio-temporal distribution of snow droughts using dynamically downscaled, high resolutions climate models." American Geophysical Union, San Francisco, CA, December 2023. (poster)

8. **Cowherd, M.**, Mital, U., Rahimi, S., Duan, S., Girotto, M., and Feldman, D., "Future changes in Western US snow distribution predictability: the case for using multi-modal observations within artificial intelligence models." American Geophysical Union, San Francisco, CA, December 2023. (poster)

7. **Cowherd, M.**, Gutmann, E., and Feldman, D., "What can we learn about snow bedforms from lidar scans at Kettle Ponds?" S3 Science Workshop, Boulder, CO, November 2023. (talk)

6. **Cowherd, M.**, Reed, C.J., Duan, S., Rahimi, S., Mital, U., Girotto, M., and Feldman, D., "ML for climate-change resilient snowpack estimation in the Western United States." HydroML Symposium, Berkeley, CA, May 2023. (breakout talk)

5. **Cowherd, M.**, Leung, L.R., and Girotto, M., "Snow droughts in E3SM." American Geophysical Union, Chicago, IL, December 2022. (poster)

4. **Cowherd, M.**, Trujillo, E., and Girotto, M., "Snow-wildland fire feedbacks in the Sierra Nevada." Western Snow Conference, Salt Lake City, UT, April 2022. (poster)

3. **Cowherd, M.** and Girotto, M., "Snow-productivity relationships in the fire-impacted Sierra Nevada."

American Geophysical Union, New Orleans, LA, December 2021. (talk)

2. **Cowherd, M.**, Baldocchi, D., and Girotto, M., "Energy flux over snow during melt season." AmeriFlux Annual Meeting, September 2021. (poster)

1. **Cowherd, M.**, Egan, G., Monismith, S. G., and Fringer, O., "Wave phase-decomposed near-bed currents and turbulence on the shoals of South San Francisco Bay." Ocean Sciences Meeting, San Diego, CA, February 2020. (poster)

TEACHING

Montana State University

ERTH 291: Snow and Ice	S 2026
ERTH 303: Weather and Climate	F 2025, S 2026

Field Courses

CUAHSI/SINTER Snow Measurements Field School	2025
Central Sierra Snow Lab Snow Science School	2025

University of California, Berkeley graduate student instructor: Comunicando Ciencias Ambientales y de la Salud (F 2022); Earth System Remote Sensing (S 2021); Intro. to Environmental Sciences (F 2020); **Outer Coast** seminar advisor: Indigenizing Futures (Su 2020); **Stanford University** course assistant: Intro. to Earth Systems (F 2019), Intro. to Environmental Systems Engineering (S 2019)

MENTORING

Montana State University

Graduate Students:

Daniel Bose, Earth Sciences PhD candidate (committee, 2025–)

Briana Whitehead, Earth Sciences PhD candidate (committee, 2025–)

Undergraduate Students:

Margaret Friese (2025–)

University of California, Berkeley

Lee Kim (forestry, 2023-2025), Shashwath Senthil (computer science, 2023-2025), Mia Jones (CSSL instrumentation, 2024), Gisele Brandt (forestry, 2023-2024), Evan Robert (computer science, H2H8 fellow 2023-2024), Julia Marks (forestry, 2022-2023), Sarah Zhang (SPUR student, 2021-2023, Babcock Prize in Environmental Science), Jieyuan Kan (SURF fellow, 2021), Hayden Street (thesis, 2020-2021)

PROFESSIONAL AFFILIATIONS

American Geophysical Union, Association for Computing Machinery High Performance Computing (SIGHPC), Western Snow Conference, American Avalanche Association, American Water Resources Association Montana Chapter

SELECTED PRESS COVERAGE

DEIXIS Magazine	2025
The Daily Californian	2025
KQED Radio	2025
KCRA3 News Sacramento	2024
DOE Office of Science	2024

OUTREACH

AGU Cryosphere Section, CryoCoffee mentor	2025
Invited career speaker, miRcore Computational Biology Camp, Ann Arbor, MI	2025
Senior thesis mentor, BASIS Independent High School, Fremont, CA	2023-2025
Presenter, Black Pine Circle 5th grade science slam, Berkeley, CA	2023

SERVICE

Peer Review:	*Environmental Research Letters*, *Journal of Climate*, *Geophysical Research Letters*, *Water Resources Research*, *Journal of Hydrology*, *Geophysical Model Development*, *Environmental Research Communications*, *npj Climate and Atmospheric Science*, *Communications Earth & Environment*, *Atmospheric Research*, *The Cryosphere*
Proposal:	Climate Change AI Innovation Grants (2024)
Conference:	CryoDA Workshop, Oslo, Norway (2025)
	"Machine learning for predicting streamflow" at HydroML, Berkeley, CA (2023)
University:	Earth Sciences Curriculum Committee (2025–)
	Faculty search committee (2024)
	Graduate admissions committee (2023)
	Chancellor's Advisory Committee on Sustainability & Climate Change (2022-2023)
	Faculty Senate Diversity, Equity, and Campus Climate Committee (2021-2022)
	Berkeley Graduate Assembly (2021-2023)
	ESPM Mentoring Faculty Working Group (2020-2021)

TRAINING

INTERSECT Research Software Engineering Bootcamp	2024
USDA Secure Water Futures Expedition	2024
EGU Snow Science Winter School	2023
NASA Snowmachine Safety Training	2023
UC Berkeley Certificate of Teaching and Learning in Higher Education	2021
UNAVCO InSAR Short Course	2021
SnowEx HackWeek, University of Washington	2021
Avalanche Recreational 2, Wilderness First Aid	

FIELD EXPERIENCE

Soda Springs, California – Moving eddy covariance arm installation	2024
Gothic, Colorado – DOE Surface Atmosphere Integrated Field Laboratory	2024
Fairbanks, Alaska – NASA SnowEx Albedo, spectroradiometry	2023
Eldorado County, California – Post-fire snow hydrology	2022-2024
Yosemite National Park, California – Fire ecology, forestry	2021
South San Francisco Bay, California – Hydrodynamics, sediment transport	2019
Nikko Bay, Palau – Hydrodynamics, seagrass ecology, seawater chemistry	2017
Durango, Colorado – Backcountry wilderness ranger, USFS San Juan NF	2017