

Anna Boser

Bren School of Environmental Science and Management

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Santa Barbara, California

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EDUCATION

University of California, Santa Barbara, California

Ph.D., Environmental Science and Management 2026 (expected)

Committee: Kelly Caylor (co-chair), Ashley Larsen (co-chair), and Tamma Carleton

University of California, Berkeley, California

B.A. with Highest Distinction, Statistics 2020

AWARDS, FELLOWSHIPS, & HONORS

University Medal, UC Berkeley (most distinguished graduating senior) 2020

National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP) 2020

Eugene Cota-Robles Fellowship, UC Santa Barbara, \$53,000 2020

Kuni Research Fellowship, \$15,000 2022

UCSB Coastal Fund Major Grant, \$11,200 2023

Schmidt Mentorship Award, \$9,000 2023

UCSB Graduate Division Gordon Research Accelerator Award, \$4,000 2022

AGU Chapman Conference on Remote Sensing of the Water Cycle Travel Grant, \$1,200 2024

Remote Sensing Technical Committee Best F22 AGU Presentation - Student Award 2022

AGU Ecohydrology Tiny Grant 2022

Undergraduate Research Apprenticeship Program Summer Fellowship, UC Berkeley 2018

RESEARCH INTERESTS

Ecohydrology, food systems, water scarcity, machine learning, remote sensing, econometrics, planetary health.

PUBLICATIONS

RESEARCH MANUSCRIPTS

1. **Anna S. Boser**, Kelly Caylor, Ashley E. Larsen, Madeleine Pascolini-Campbell, John T. Reager, Tamma Carleton. "Field-scale crop water consumption estimates reveal potential water savings in California agriculture." *Nature Communications*. (2024).
2. **Anna S. Boser**. "Validating spatio-temporal environmental machine learning models: Simpson's paradox and data splits." *Environmental Research Communications*. (2024).
3. Tyler Liddell, **Anna S. Boser**, Sara Orofino, Tracey Mangin, Tamma Carleton. "stagg:: A data pre-processing R package for climate impacts analysis." *Environmental Modelling & Software*. (In review).
4. Andrew J. MacDonald, David Hyon, Samatha Sambado, Kacie Ring, **Anna S. Boser**. "Remote sensing of

temperature-dependent mosquito and viral traits predicts field surveillance-based disease risk.” Ecology. (In review).

5. Brian Lee, Samantha Sambado, D. Nākoa Farrant, **Anna S. Boser**, Kacie Ring, David Hyon, Ashley E. Larsen, and Andrew J. MacDonald. “Bat activity reveals targeted foraging with agricultural and vector disease control implications.” Agriculture, Ecosystems and Environment. (In review).
6. **Anna S. Boser**, Daniel Sousa, Ashley E. Larsen, Andrew J. MacDonald. “Micro-climate to macro-risk: mapping fine scale differences in mosquito-borne disease risk using remote sensing.” Environmental Research Letters. (2021).
7. Jennifer R. Head, ... **Anna S. Boser**..., Justin Remais. “The effect of school closures and reopening strategies on COVID-19 infection dynamics in the San Francisco Bay Area: a cross-sectional survey and modeling analysis.” MedRxiv (2020).
8. Mosnier E, Epelboin L, Guiraud N, Huber F, Adriouch L, Guarmit B, **Anna S. Boser**, ... Nacher, M. “Spatial dynamics and epidemiology for AIDS in remote areas in French Guiana.” AIDS Care, 1-7 (2018).
9. **Anna S. Boser**, Bidaud B, Maues S, Guiraud N, Mendes AM, Lacapere F Rhodes S, Huber F, Adriouch L, Nacher M, Mosnier E. “Addressing HIV on the French Guianese-Brazilian border: No choice but collaboration!” AIDS 32, 539–542 (2018).

CONFERENCE PAPERS, PRESENTATIONS AND POSTERS

1. **Anna S. Boser**, Kelly Caylor, Ashley E. Larsen, Madeleine Pascolini-Campbell, John T. Reager, Tamma Carleton. “Field-scale crop water consumption estimates reveal potential water savings in California agriculture.” AGU Chapman Conference on Remote Sensing of the Water Cycle: Sensors to Science to Society. Honolulu, Hawaii. February 2024.
2. Yang Hu, Kelly Caylor, **Anna S. Boser**. “Segment-then-Classify: Few-shot instance segmentation for environmental remote sensing.” Tackling Climate Change with Machine Learning at NeurIPS. New Orleans, Louisiana. December 2023.
3. Jason Perez, Yang Hu, **Anna S. Boser**, Kelly Caylor. “Mapping and monitoring center pivot irrigation in data-poor settings.” American Geophysical Union. San Francisco, California. December 11-17 2023.
4. **Anna S. Boser**, Ryan Stofer, Kelly Caylor. “Downscaling remote sensing data using deep learning.” TWEEDS. Eugene, Oregon. September 15-16 2023.
5. **Anna S. Boser**, Tamma Carleton, Ashley Larsen, Madeleine Pascolini-Campbell, John T. Reager, Kelly Caylor. “Estimating agricultural water consumption and irrigation efficiency in California using machine learning and remote sensing.” American Geophysical Union. Chicago, Illinois. December 12-16 2022.
6. **Anna S. Boser**, Ryan Stofer, Kelly Caylor. “Super-resolution of Land Surface Temperature Using Deep Learning.” American Geophysical Union. Chicago, Illinois. December 12-16 2022.
7. Tyler Liddell, **Anna S. Boser**, Sara Orofino, Tracey Mangin, Tamma Carleton.. “Stagg: An R Package for Spatiotemporal Aggregation of ERA5 Climate Data.” Chicago, Illinois. American Geophysical Union. December 12-16 2022.
8. **Anna S. Boser**, Tamma Carleton, Ashley Larsen, Madeleine Pascolini-Campbell, John T. Reager, Kelly Caylor. “Machine learning and remote sensing elucidate an 80% water savings potential in California agriculture.” TWEEDS. Eugene, Oregon. October 7-8 2022.
9. **Anna S. Boser**, Madeleine Pascolini-Campbell, John T. Reager. ECOSTRESS detects a 20% increase in evapotranspiration over agricultural lands in California. American Geophysical Union. New Orleans, Louisiana. December 2021.
10. **Anna S. Boser**, Daniel Sousa, Ashley Larsen, Andrew MacDonald. “Mosquito-borne disease risk mapping at high spatial and temporal resolutions using remotely sensed land surface temperature measurements.” Ecological Society of America. Long Beach, California. August 2021.
11. **Anna S. Boser**, Christian White, Mohammad Al-Hamdan. “Using Statistical and Machine Learning Models with Remotely Sensed Data to Estimate PM_{2.5} in the San Francisco Bay Area.” American Geophysical Union.

San Francisco, California. December 1-17 2020.

12. **Anna S. Boser**, Samuel Evans, Matthew D. Potts. “The Effect of Prescribed Burn Smoke on Emergency Department Visits and Hospitalizations in California.” 3rd International Smoke Symposium. Davis, California. April 20-24 2020.
13. **Anna S. Boser**, Bidaud B, Adriouch L, Epelboin L, Guiraud N, Gaillet M, Carrera C, Brousse P, Mosnier E. “VIH sur la frontière franco-brésilienne: mobilité et précarité sur une région en épidémie généralisée. 18th National Congress of the French Society for the Fight Against AIDS (SFLS).” Nice, France. Oct 19-20, 2017.

TEACHING AND MENTORSHIP EXPERIENCE

Teaching assistant, UCSB, EDS 217: Principles of Environmental Data Science	2023
Mentor, UCSB EUREKA summer undergraduate internship. Mentee: Jason Perez	2023
Mentor, Bren Environmental Diversity Leaders and Mentorship Program. Mentee: Yang Hu	2023
Mentor, WAVES lab undergraduate research. Mentees: Ryan Stofer, Mitali Gaidhani	2022-2023
Mentor, emLab summer undergraduate internship. Mentee: Tyler Liddell	2022
Tutor, UCSB, EDS 217: Principles of Environmental Data Science	2022
Mentor, UCSB Data Science Capstone Project	2022
Teaching Assistant, UCSB, ESM 203: Earth Systems Science	2021

OTHER ACADEMIC POSITIONS AND EXPERIENCE

Intern, NASA Jet Propulsion Laboratory. Advisors: JT Reager and Madeleine Pascolini-Campbell	2021
Intern, NASA Marshall Space Flight Center. Advisor: Mohammed Al-Hamdan	2020
Research Assistant, UC Berkeley College of Natural Resources. Advisor: Matthew Potts	2019-2020
Research Assistant, UC Berkeley School of Public Health. Advisor: Daniel Perlman	2017-2019

PROFESSIONAL SERVICE & MEMBERSHIP

Outreach Chair, Women in Science and Engineering, UCSB	2023-Present
Reviewer, CV4Ecology Summer Program at California Institute of Technology	2023, 2024 (x2)
Member, American Geophysical Union	2020-Present
Member, Ecological Society of America	2020-2021
Reviewer, World Development	2022
Bren Anti-Racism Caucus, UCSB	2021-Present
Bren Seminar Committee, UCSB	2021-2022
Bren PhD Symposium Committee, UCSB	2021

INVITED TALKS

NASA Jet Propulsion Laboratory, Caltech	May 6, 2024
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Field-scale crop water consumption estimates reveal potential water savings in California agriculture

GS3 Seminar Series, Center for Scientific Computing, UCSB	August 23, 2023
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Ten-fold super-resolution of remote sensing data using weakly supervised deep learning

GS3 Seminar Series, Center for Scientific Computing, UCSB

July 20, 2022

Machine learning and remote sensing elucidate an 80% water savings potential in California agriculture

NASA ECOSTRESS Annual Team Meeting

April 12-14, 2022

Micro-climate to macro-risk: Mapping fine scale differences in mosquito-borne disease risk

Agriculture's effects on evapotranspiration and runoff generation in California

MEDIA COVERAGE

CalMatters, Rachel Becker

March 26, 2024

California farmers could save a lot of water — but their profits would suffer

Newsweek, Robyn White

March 25, 2024

California 'Overlooking' Ways To Save Water, Study Suggests

The Current, UC Santa Barbara, Harrison Tasoff

March 25, 2024

Small changes can yield big savings in agricultural water use

USGS Earth Resources Observation and Science (EROS) Center "Eyes on Earth" Podcast

June 27, 2022

Episode 76 – ECOSTRESS and Disease Risk

TEDx Youth Talk: *How to Save the Earth from Space*

February 29, 2022

SYNERGISTIC ACTIVITIES

Participant, UCSB Science Storytelling for Impact workshop

2023

Participant, ESIL Innovation Summit

2023

Participant, CV4Ecology Summer Program at California Institute of Technology

2022

Participant, Center for Inclusive Teaching and Learning (CITRAL) Community of Practice (CooP)

2022-2023