Anna I. Spiers

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Earth & Environmental Sciences
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Education

Ph.D. in Ecology & Evolutionary Biology. University of Colorado Boulder 2023
Committee: Brett Melbourne, Kendi Davies, Carol Wessman, Katherine Suding, Megan Cattau

B.A. in Mathematics. Williams College 2015
Advisor: Julie Blackwood

Professional Experience

Postdoctoral Research Fellow. Lawrence Berkeley National Lab 2023 - *present*
Research intern. The Nature Conservancy Washington 2022
Research consultant. Forestoration International 2021 - 2022
Graduate teaching/research assistant. Department of Ecology & Evolution 2017 - 2023
Graduate research assistant. Earth Lab Analytics Hub/CIRES 2019 - 2020

Publications

9. **Spiers, Anna I.**, Victoria M. Scholl, Joseph McGlinchy, Jennifer K. Balch, and Megan E. Cattau. (*in press*). A review of UAS-based estimation of forest traits and characteristics in landscape ecology. *Landscape Ecology.* Preprint: https://doi.org/10.32942/osf.io/xjdt3
8. Atkins, Jeff. W., L. P. Bhatt, L. Carrasco, E. Francis, J.E. Garabedian, C.R. Hakkenberg, B.S. Hardiman, J. Jung, A. Koirala, E.A. LaRue, S. Oh, G. Shao, G. Shao, H.H. Shugart, **A.I. Spiers**, et al. (2023). Integrating Forest Structural Diversity Measurement into Ecological Research. *Ecosphere.* https://doi.org/10.1002/ecs2.4633
7. Mahood, Adam L., Maxwell B. Joseph, **Anna I. Spiers**, Michael J. Koontz, Nayani Ilangakoon, Kylen Solvik, Nathan Quarderer, et al. (2023). Ten simple rules for working with high resolution remote sensing data. *Peer Communities In Ecology.* https://doi.org/10.24072/pcjournal.223
6. Koontz, Michael J., Victoria Scholl, **Anna I. Spiers**, Megan E. Cattau, John Adler, Joseph McGlinchy, Tristan Goulden, Brett A. Melbourne, and Jennifer K. Balch. (2022). Democratizing macroecology: integrating uncrewed aerial systems with the National Ecological Observatory Network. *Ecosphere.*
5. **Spiers, Anna I.**, J. Andy Royle, Christa L. Torrens, and Maxwell B. Joseph. (2022). Estimating occupancy dynamics and encounter rates with species misclassification: a semi-supervised, individual-level approach. *Methods in Ecology & Evolution.* https://doi.org/10.1111/2041-210X.13858
4. Nagy, Chelsea R., Jennifer K. Balch, and 118 co-authors. 2021. Harnessing the NEON data revolution to advance open environmental science with a diverse and data capable community. *Ecosphere.* https://doi.org/10.1002/ecs2.3833
3. Haefke, Brandon J., **Anna I. Spiers**, William R. Miller, and Meg D. Lowman. 2014. Tardigrades of the Canopy: *Doryphoribius elleneddiei* nov. sp. (Eutardigrada, Parachela, Hypsibiidae), a New Species from Eastern Kansas, U.S.A. *Transactions of the Kansas Academy of Science.* https://doi.org/10.1660/062.118.0106

2. **Spiers, Anna I.**, Brandon J. Haefke, William R. Miller, and Meg D. Lowman. 2013. Tardigrades in the Canopy: *Doryphoribius dawkinsi* Michalczyk and Kaczmarek, 2010 - New records from eastern Kansas, U.S.A. *Transactions of the Kansas Academy of Science.* 116(3/4):125-128. https://doi.org/10.1660/062.117.0319

1. Brandon J. Haefke, **Anna I. Spiers**, William R. Miller, and Meg D. Lowman. 2013. Tardigrades in the Canopy: Using Double Rope Techniques to Conduct Sampling Along Vertical Transects. *Transactions of the Kansas Academy of Science.* 116(3-4):119-124. https://doi.org/10.1660/062.116.0303

Manuscripts in progress

In prep

Spiers, Anna I., Kendi Davies, and Brett Melbourne. (*in prep*). Linked disturbance interaction amplifies fire's effects: Synergistic effects of forest fragmentation on fire severity in a *Eucalyptus* community. Target: *Ecology.*

Spiers, Anna I., Sy-Toan Ngo, Carissa DeRanek, Adam Hanbury-Brown, Venkata S. Konduri, Elsa Ordway, Gilberto Pastorello, Fabian Schneider, and Marcos Longo. (*in prep*). Leveraging airborne remote sensing for forest structure and composition estimation to initialize a process-based vegetation model in a fire-mediated landscape. Target: *Biogeosciences.*

Currently Funded Work

Co-Investigator, NASA ROSES GEDI — 2024 - 2027

Project: Integrating GEDI and Process-Based Ecosystem Modeling to Assess the Impact of Wildfires on Forest Structure and Recovery

Collaborators: Marcos Longo (PI), Robinson Negrón-Juárez (Co-I)

Postdoc, DOE Laboratory Directed Research and Development Grant — 2022 - 2025

Project: An Integrated Remote-Sensing/Model Workflow for Quantifying the Role of Diverse Forests on the Earth System

Collaborators: Marcos Longo (PI), Nicola Falco

Contributed to the proposal development for year 3

Awards and Honors

Total: $89,443

PEO Scholar Award ($20,000)	2022 - 2023
NSF INTERN Grant ($43,074)	2022
CU Boulder EBIO Conference Travel Grant ($1,000)	2022
CU Boulder EBIO Research Grant ($7,159)	2018 - 2021 (sans 2020)
Graduate School Travel Grant ($600)	2019, 2022
Graduate School University Fellowship ($2,360)	2018
AAUW Brown-Ricketts-Udick Grant ($1,000)	2018
Student Government Small Group Grant ($750)	2018
Kate Hogan Women's Athletic Award	2015
Williams College Class of 1957 Scholar	2012 - 2015
Athletic Conference (NESCAC) All-Sportsmanship Team Honor	2014
Robert G. Wilmers, Jr. 1990 Memorial Student Travel Fellowship ($5,000)	2014
Richmond Times-Dispatch Scholar-Athlete Scholarship ($7,500)	2011
AKA Sorority Academic Honor Scholarship ($1,000)	2011

Mentorship

Undergraduate mentorship

Trisha Venkatesh, University of Colorado Boulder (Environmental Sciences major). Mentored FATES project scraping plant traits for tropical forests in Asia and Africa from publicly available databases through UCB SPUR program — 2024 - present

Mara St. Amantn, University of California Berkeley (Environmental Sciences major). Mentored FATES project scraping plant traits for California forests from publicly available databases through UCB SPUR program (e.g., primary literature reading, statistics, scientific writing) — 2024

Hailey Perryman, University of Colorado Boulder (Ecology major). Mentored throughout honors thesis (e.g., primary literature reading, statistics, scientific writing) — 2022 - 2023

Amber Kou, University of Colorado Boulder (Computer Science major). Mentored in satellite image time-series processing in R — 2022

Wyatt Metelman-Alvis, University of Colorado Boulder (Ecology major). Mentored throughout honors thesis (e.g., primary literature reading, statistics, scientific writing) — 2021 - 2022

Jacob Hornfeldt, University of Florida (Entomology and Nematology major). Ecological Society of America Meeting SEEDS Program — 2020

Graduate peer mentorship

Chris Arehart, University of Colorado Boulder (Evolutionary Biology). Mentored for research rotation regarding remote sensing data manipulation — 2021

Skylar Lynch, University of Colorado Boulder (Evolutionary Biology). Graduate School Peer Mentorship Program. Offered guidance and support to new graduate students to fulfill the need for mentoring across disciplinary boundaries and to build community among different graduate student populations. — 2019 - 2020

Isaiah Tristan, University of Colorado Boulder (Astrophysics). Graduate School Peer Mentorship Program. Offered guidance and support to new graduate students to fulfill the need for mentoring across disciplinary boundaries and to build community among different graduate student populations. — 2018 - 2019

Teaching Experience

Teaching assistant

EBIO 1240 General Biology 2, University of Colorado Boulder — 2023

EBIO 2040 Principles of Ecology, University of Colorado Boulder — 2017 - 2018, 2022

EBIO 3590 Plants and Society, University of Colorado Boulder — 2020

MATH 200 Discrete Math, Williams College — 2014

Formal training

Inclusive Pedagogy, University of Colorado Boulder — 2018

Open Education Resources

Spiers, Anna I. 2021. From csv to slippy map: Introduction to Spatial Data in R. August 2021. R-Ladies Boulder Chapter Meeting.
`https://github.com/annaspiers/spatial-data_mapping_RLadies`

Spiers, Anna I. Submitting to the Ecological Forecasting Challenge. June 2021. Ecological Forecasting Initiative Student Association Early Career Workshop.
`https://github.com/eco4cast/EFISA_Workshops_June2021`
Presentation: `https://youtu.be/S8x5rLtltDU`

Publications (non-refereed)

Robin L. Chazdon and **Anna I. Spiers**. 2021. Reviving traditional land-use practices to restore landscape and livelihoods in Shinyanga, Tanzania. Collaboration between Forestoration International and Restor.

Sarah J. Wilson, Sophie McCallum, and **Anna I. Spiers**. 2021. The hidden forest: farmers tend regenerating trees in African Drylands. Collaboration between Forestoration International and Restor.

Invited Talks

Spiers, Anna I.. The Sims for trees: remote sensing and process-based models. SatCamp Lightning Talks. 2024

Spiers, Anna I.. Synergistic impacts of wildfire and forest fragmentation on tree mortality. Landscape Ecology course at University of Colorado Boulder (Prof. Julian Resasco). 2023

Spiers, Anna I.. Fragmentation and Drought and Fire, Oh My. Departmental Meeting for Prospective Students Lightning talks. 2022

Spiers, Anna I., Carl Boettiger, Tad Dallas, Nico Franz, Brett A. Melbourne, Kari Norman, Eric Sokol, Thilina Surasinghe, and Kelsey Yule. Forecasting Beetle Community Metrics. Ecological Forecasting Initiative Student Association Early Career Workshop. https://youtu.be/7196wcarMXQ 2021

Spiers, Anna I. Forecasting invertebrate distributions in a fragmented landscape. Remote Sensing of the Environment course at Boise State University (Prof. Megan Cattau). 2020

Contributed Presentations

Talks

Spiers, Anna I., Sy-Toan Ngo, Gilberto Pastorello, Polly C.Thornton, Fabian Schneider, Venkata S Konduri, Adam Hanbury-Brown, Carissa DeRanek, Elsa Ordway, and Marcos Longo. Initializing a process-based vegetation model, FATES, with airborne-derived forest structure and composition in a fire-mediated landscape (15 min). MtnClim. 2024

Spiers, Anna I., Sy-Toan Ngo, Gilberto Pastorello, Polly C.Thornton, Fabian Schneider, Vennkata S Konduri, Adam Hanbury-Brown, and Marcos Longo. Leveraging airborne remote sensing for forest structure and composition estimation to initialize a process-based vegetation model, FATES, in a fire-mediated landscape (12 min). Ecological Society of America Annual Meeting. 2024

Spiers, Anna I., Brett Melbourne, and Kendi F. Davies. Synergistic impacts of wildfire and forest fragmentation on tree mortality (12 min). Ecological Society of America Annual Meeting. 2023

Spiers, Anna I., Brett Melbourne, and Kendi F. Davies. Linked disturbances in Australia: Synergistic impacts of wildfire and forest fragmentation on tree mortality (45 min). Earth Lab Environmental Data Science Seminar. *Remote*. 2022

Spiers, Anna I., Carl Boettiger, Tad Dallas, Nico Franz, Brett A. Melbourne, Kari Norman, Eric Sokol, Thilina Surasinghe, and Kelsey Yule. Forecasting the responses of beetle community metrics (5 min INSPIRE talk). Ecological Society of America Annual Meeting. *Remote Conference*. 2021

Spiers, Anna I., Luis Allende, Kendi F. Davies, Max B. Joseph, Brett A. Melbourne, Christa Torrens, and Grant Vagle. Forecasting carabid distribution shifts with global warming using remote sensing and open source data (5 min lightning talk). Society for Conservation Biology North America Annual Meeting. *Remote Conference*. 2020

Victoria Scholl, **Spiers, Anna I.**, Michael J. Koontz, Megan E. Cattau. Integrating UAS with Airborne Neon Data for Ecological Applications (15 min). American Society for Photogrammetry and Remote Sensing (ASPRS) Annual Meeting. *Remote Conference.* 2020

Spiers, Anna I. Remote sensing: what can it do for EEB and what resources are at CU Boulder? (45 min). Departmental Lunch and Learn Seminar. 2019

Spiers, Anna I. Female Role Models in Mathematical Ecology (30 min). American Association for University Women Boulder Chapter Meeting. 2019

Spiers, Anna I., Kendi F. Davies, Brett A. Melbourne, Megan E. Cattau, and Keith Musselman. Let the Sunshine In: Modeling solar radiation in a fragmented landscape (45 min). Earth Lab Incubator. 2019

Spiers, Anna I. The science of Pura Vida: Tropical exploration through the Organization for Tropical Studies (45 min). Departmental Lunch and Learn Seminar. 2019

Spiers, Anna I. Habitat Fragmentation (3 min). University of Colorado Student Research Spring Symposium. 2018

Spiers, Anna I. and Julie C. Blackwood. Predicting the Future: How to Predict Critical Transitions in Ecological Systems (45 min). Williams College Department of Mathematics Senior Colloquium. 2014

Posters

Spiers, Anna I., Sy-Toan Ngo, Gilberto Pastorello, Polly C. Thornton, Fabian Schneider, Venkata Shashank Konduri, Adam Hanbury-Brown, and Marcos Longo. Initializing ELM-FATES, a process- based vegetation model, with forest structure and composition estimated from airborne remote sensing. American Geophysical Union. 2023

Spiers, Anna I., Brett A. Melbourne, and Kendi F. Davies. Synergistic impacts of wildfire and experimental forest fragmentation on tree mortality. Ecological Society of America Annual Meeting. *Remote Conference.* 2021

R. Quinn Thomas, Carl Boettiger, Cayelan Carey, Michael Dietze, and 14 more co-authors. Introducing the NEON Ecological Forecasting Challenge hosted by the Ecological Forecasting Initiative Research Coordination Network. American Geophysical Union Annual Meeting. *Remote Conference.* 2020

Spiers, Anna I., Luis Allende, Kendi F. Davies, Max B. Joseph, Brett A. Melbourne, Christa Torrens, and Grant Vagle. NEON: Forecasting carabid beetle dynamics in forests. Ecological Society of America Annual Meeting. *Remote Conference.* 2020

Spiers, Anna I., Megan E. Cattau, Joseph McGlinchy, Brian Johnson, Brett A. Melbourne, and Kendi F. Davies. Combining UAV remote sensing and ground sensors to model understory solar radiation and thermal habitat in a fragmented forest landscape. Ecological Society of America Annual Meeting. 2019

Spiers, Anna I., Brett A. Melbourne, and Kendi F. Davies. Combining UAV remote sensing and ground sensors to model understory solar radiation and thermal habitat in a fragmented landscape. Cooperative Institute for Research in Environmental Sciences Annual Rendezvous. 2019

Spiers, Anna I., Jacqueline Wentz, Brett A. Melbourne, and Kendi F. Davies. The role of *Eucalyptus radiata* in a fragmented landscape. Guild of Rocky Mountain Ecologists and Evolutionary Biologists Annual Meeting. 2018

Spiers, Anna I., Jacqueline Wentz, Brett A. Melbourne, and Kendi F. Davies. Modeling *Eucalyptus radiata* canopy response to habitat fragmentation. Ecological Society of America Annual Meeting. 2018

Service

Manuscript reviewer. Biological Invasions, Environmental Research Letters, Environmental Research: Climate

Ambassador. National Ecological Observatory Network Science Ambassador (link) 2024-*present*

Member. Graduate student panel for prospective students 2018-22

Co-coordinator. Departmental Lunch and Learn Seminar series 2022

Member. Departmental working group to design/implement an antiracist policy 2021

Python Assistant. NC CASC Climate Data 101 in Python Workshop 2021

Team lead. Ecological Forecasting Initiative Forecasting Challenge Design Team: Beetle Communities 2020 - 2021

Member. NEON Ecological Forecasting Technical Working Group 2019 - 2021

Quantitative Think Tank: Departmental quantitative methods discussion group

Member 2017 - 2020

Leader 2020

Organizer. Departmental Spring Student Research Symposium 2018 - 2019

Organizer. Departmental Non-Academic Career Panel 2018

Board Member. Student Math & Statistics Advisory Board 2013 - 2014

Student ambassador. NCAA Substance Abuse Awareness (APPLE) Committee 2013 - 2014

Outreach

Scientist. Science Accelerating Girls' Engagement Summer Camp 2024

Pen Pal. Letters to a Pre-Scientist 2018 - *present*

Judge. International Virtual Science Symposium 2019 - 2023 (sans 2021)

Scientist. Girls On (GO) STEM workshops and fair 2020

Judge. Swigert Elementary School Science Fair 2020

Member. Inspiring Girls Expeditions: Girls on Rock 2019

Organizer. Boulder-Denver City Nature Challenge BioBlitz 2019

Invited writer. Natural History of Ecological Restoration blog by Dr. Leighton Reed 2019

Outdoor educator. Thorne Nature Experience at Pioneer Bilingual Elementary School 2019

Member. Departmental Evolution Outreach Committee 2018

Skills and Proficiencies

Coding languages: Use regularly: `R`, `Python`, Use rarely: `MatLab`

Data manipulation and visualization in R: `tidyverse` (`dplyr`, `ggplot2`, `tidyr`, `data.table`, `tmap`)

GIS: `R` (`terra`, `sf`, `lidR`), Structure from Motion photogrammetry (Agisoft Metashape), QGIS

Inference: Hierarchical modeling in `R` using Bayesian frameworks (`rstan`, `jagsUI`) and maximum likelihood (`lme4`), agent-based simulation modeling in Bash

Fieldwork: Formerly certified UAS pilot, Vegetation plot establishment, Tree stem mapping using laser instruments, Tree climbing certificate from Tree Climber's International

Version control: git, GitHub

Dynamic documents: RMarkdown, LaTeX

Spoken language: Fluent: English, Conversational: Spanish, American Sign Language

Professional Memberships

Ecological Society of America	2019 - present (sans 2020)
American Geophysical Union	2023 - present
Association for Women in Science	2024 - present