

Katherine Siegel

Assistant Professor, Department of Geography
Fellow, Cooperative Institute for Research in Environmental Science
University of Colorado-Boulder, Boulder, CO 80302
<https://www.colorado.edu/lab/fowllab/>

Academic appointments

- 2024- Assistant Professor, *Department of Geography and Cooperative Institute for Research in Environmental Science, University of Colorado-Boulder*
- 2024 Assistant Professor, *Institute of Forestry and Conservation, University of Toronto*
- 2023 Research Associate, *Department of Ecology & Evolutionary Biology, University of Colorado-Boulder*
- 2021-2023 NOAA Climate & Global Change Postdoctoral Fellow, *Department of Ecology & Evolutionary Biology, University of Colorado-Boulder*

Education

- 2016-2021 PhD in Environmental Science, Policy, & Management, University of California-Berkeley
- 2013-2014 MS in Biodiversity, Conservation, & Management, Oxford University
Advisor: Dr. Robert Whittaker
Degree with Distinction
- 2009-2013 BS in Environmental Science, Brown University
Advisor: Dr. Heather Leslie
Magna cum laude, Departmental honors

Honors & awards

- 2023 Rising Star Award, Third Place, *Conservation Biology*
- 2021 Nominee, Extraordinary Teaching in Extraordinary Times Award, UC Berkeley
- 2014 Worcester College Prize for Distinction in Graduate Study, Oxford University
- 2013 Award for Outstanding Achievement in the Field of Environmental Sciences, Brown University

Publications

Total peer-reviewed publications: 14; first-authored: 6. Web of Science statistics from January 2025: h-index = 7, total citations = 406.

14. **Siegel K**, Dee L (2025) Foundations and future directions for causal inference in ecological research. *Ecology Letters*, 28(1), e70053. <https://doi.org/10.1111/ele.70053>
13. Starrs G, **Siegel K**, Larson S, Bustic V (2024) Quantifying large-scale impacts of cattle grazing on annual burn probability in Napa and Sonoma Counties, CA. *Ecology & Society*, 29(3), 10. <https://doi.org/10.5751/ES-15080-290310>
12. LoPresti A, Hayden M, **Siegel K**, Poulter B, Stavros N, Dee L (2024) Remote sensing applications for prescribed burn research. *International Journal of Wildland Fire*, 33(6). <https://doi.org/10.1071/WF23130>
11. **Siegel K**, Cavanaugh K, Dee L (2024) Balancing multiple management objectives as climate

- change transforms ecosystems. *Trends in Ecology & Evolution*, 39(4), 381-395.
<https://doi.org/10.1016/j.tree.2023.11.003>
10. **Siegel K**, Macaulay L, Shapero M, Becchetti T, Larson S, Mashiri F, Waks L, Butsic V (2022) Impacts of livestock grazing on wildfire probability vary by region and vegetation type in California. *Journal of Environmental Management*, 322, 116092.
<https://doi.org/10.1016/j.jenvman.2022.116092>
 9. **Siegel K**, Larsen L, Stephens C, Stewart W, Butsic V (2022) Quantifying drivers of change in social ecological systems: land management impacts wildfire probability in forests of the western US. *Regional Environmental Change*, 22, 98.
<https://doi.org/10.1007/s10113-022-01950-y>
 8. Kinnebrew E, Ochoa J, French M, Mills-Novoa M, Shoffner E, **Siegel K** (2022) Biases and limitations of Global Forest Change and author-generated land cover maps in detecting deforestation in the Amazon. *PLoS ONE*, 17(7), e0268970.
<https://doi.org/10.1371/journal.pone.0268970>
 7. Shapero M, **Siegel K**, Gallo J, Brice J, Butsic V (2022) Land cover conversion and land use change combine to reduce grazing. *Journal of Land Use Science*, 17(1), 339-350.
<https://doi.org/10.1080/1747423X.2022.2086311>
 6. **Siegel K**, Farah Perez A, Kinnebrew E, Mills-Novoa M, Ochoa J, Shoffner E (2022) Integration of qualitative and quantitative methods for land-use-change modeling in a deforestation frontier. *Conservation Biology*, 36(6), e13924.
<https://doi.org/10.1111/cobi.13924>
 5. Free C, Cabral R, Battista W, Ojea E, O'Reilly E, Palardy JE, Froehlich HE, García Molinos J, **Siegel K**, Arnason R, Juinio-Meñez MA, Fabricius K, Turley C, Gaines SD (2022) Expanding ocean food production under climate change. *Nature*, 605(7910), 490-496.
<https://doi.org/10.1038/s41586-022-04674-5>
 4. Kinnebrew E, Shoffner E, Farah Perez A, Mills-Novoa M, Ochoa J, **Siegel K** (2020) A review and typology of methodological approaches to interdisciplinary mixed methods research in land change science and environmental management. *Conservation Biology*, 35(1), 130-141. <https://doi.org/10.1111/cobi.13642>
 3. **Siegel K**, Cabral RB, McHenry J, Ojea E, Owashi B, Lester SE (2019) Sovereign states in the Caribbean have lower social-ecological vulnerability to coral bleaching than overseas territories. *Proceedings of the Royal Society B*, 286(1897), 20182365.
<https://doi.org/10.1098/rspb.2018.2365>
 2. McDonald G, Campbell S, Karr K, Clemence M, Granados-Dieseldorff P, Jakub R, Kartawijaya T, Mueller JC, Prihatinningsing P, **Siegel K**, Syaifudin Y (2018) An adaptive assessment and management toolkit for data-limited fisheries. *Ocean & Coastal Management*, 152(1), 100-119. <https://doi.org/10.1016/j.ocecoaman.2017.11.015>
 1. Leslie H, Basurto X, Nenadovic M, Sievanen L, Cavanaugh K, Cota-Nieto J, Erisman B, Finkbeiner E, Hinojosa-Arango G, Moreno-Báez M, Nagavarapu S, Reddy S, Sanchez-Rodríguez A, **Siegel K**, Ulibarria-Valenzuela JJ, Hudson Weaver A, Aburto-Oropeza A (2015) Operationalizing the social-ecological systems framework to assess sustainability. *Proceedings of the National Academy of Sciences*, 112(19), 5979-5984.
<https://doi.org/10.1073/pnas.1414640112>

Manuscripts in review or in revision

3. **Siegel K**, Mills-Novoa M, Kinnebrew E, Ochoa J, Shoffner E. Land use change models that

- integrate quantitative and qualitative approaches better explain deforestation patterns in Amazonian protected areas. In review at *Landscape Ecology*.
2. Dudley J, Dee L, Heilmayr R, Byrnes J, **Siegel K**. A causal inference framework for climate change attribution in ecology. In revision at *Ecology Letters*.
 1. Lynch A, Ashander J, Ciocco A, Cravens A, Dassow C, Dee L, Dunham J, Eaton M, Embke H, Hennessy J, Latzka A, Lawrence D, Littell J, Miller B, Palasti L, Runge M, Sass G, Shultz A, **Siegel K**, Svancara L, Thompson L, Thurman L, Valler J, Weiskopf S, Yocum H. RAD (Resist-Accept-Direct) switch points and triggers for adaptation planning. In review at *Journal of Environmental Management*.

Conference proceedings

1. Thomas L, **Siegel K**, Owashi B, Estep A, Gedamke T, Lester S. (2015) Determining effective fisheries monitoring and assessment approaches in data-limited contexts: a case study of the fisheries in Montserrat and Curaçao. *Proceedings of the 68th Gulf and Caribbean Fisheries Institute Conference*, 68, 238-246, Panama City, Panama.

Technical reports

3. **Siegel K**, Thomas L, Lester S (2015) A review of the ecology and economics of Montserrat's marine resources. Sustainable Fisheries Group, University of California-Santa Barbara. pp. 31. https://docs.wixstatic.com/ugd/47d1fd_dc0a3205bfc44ea3ab31d6f1fc61c965.pdf
2. Thomas L, **Siegel K**, Lester S (2015) A review of the ecology and economics of Curaçao's marine resources. Sustainable Fisheries Group, University of California-Santa Barbara. pp. 30. https://www.waaittinstitute.org/files/ugd/47d1fd_a39bedeabeed4fe2b9407d31ba81e26a.pdf
1. **Siegel K**, Thomas L, Clavelle T, Lester S (2016) Economic valuation of Curaçao's marine resources. Sustainable Fisheries Group, University of California-Santa Barbara. pp. 50. https://www.waaittinstitute.org/files/ugd/47d1fd_93b3e06900f74a6eab2c3c2adb6d50c2.pdf

Nontechnical Writing

- Siegel K** (2018) Making landfall: hurricanes and agriculture. *Berkeley Review of Latin American Studies*, Fall 2018. pp. 60-62. <https://clas.berkeley.edu/sites/default/files/shared/docs/tertiary/BRLASFall2018-SIEGEL.pdf>

Research funding

Current projects – total \$1,250,762

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| 2024 | Public & Community Engaged Scholarship Grant, Tier 2, CU Boulder, “Equitable wildfire risk reduction in western Boulder County.” PI: Siegel K , Collaborators: Dee L, Olvera Hernandez S (\$2,010). |
| 2024-2027 | US Forest Service Research & Development, “Assessing fuels treatment impacts For wildfire risk, forest carbon, and wildlife habitat.” PIs: Ditmer M, Steel Z, Collaborator: Battaglia M, Cooperators: Siegel K , Dee L, Miller S, Amaral C, Ilangakoon G, Wittemyer G, LoPresti A, Keppel-Aleks G (\$992,000). |
| 2023-2025 | North Central Climate Adaptation Science Center, “Operationalizing the Resist |

Accept-Direct framework to manage wildfires and carbon storage in the context of ecological transformations in the Greater Yellowstone Ecosystem.” **PI: Siegel K**, Co-PIs: Dee L, Olliff T, Rodman A (\$256,752).

Funding for professional development

2024 Faculty Success Program Grant, Office of Faculty Affairs, CU Boulder, \$5250

Previous projects and funding

2023-2024 NASA NSPIRES, “NASA-Rx Fire: Prescribed Fire to Support Ecosystem Services.” PI: Stavros N, Co-Is: Hummel do Amaral C, Dee L, **Collaborators: Siegel K**, Battaglia M (\$249,821).

2021-2023 NOAA Climate & Global Change Postdoctoral Fellowship (\$163,280)

2021 Baker-Bidwell-Hall-Rosencrans Fellowship, UC Berkeley (\$22,643)

2020 Walter & Ruth Schubert Summer Prize, UC Berkeley (\$2,437)

2018-2020 National Socio-Environmental Synthesis Center, “The interactions between agricultural expansion and conservation prioritization, discourse, and practice: a multi-scalar analysis in the Amazon Basin.” **Co-PIs: Siegel K**, Mills-Novoa M, Co-Is: Shoffner E, Kinnebrew E, Farah Perez A, Ochoa J (\$10,000).

2018-2020 SESYNC Graduate Student Research Fellowship (\$2,000)

2018 Tinker Field Research Grant, Center for Latin American Studies, UC Berkeley (\$750)

2018 Chapter Travel Grant, Society for Conservation Biology (\$400)

2017-2018 G. Fitzgarrald Martin Fellowship, UC Berkeley (\$48,631)

2017 Graduate Assembly Travel Award, UC Berkeley (\$750)

2017 Environmental Science, Policy, & Management Research Starter Grant, UC Berkeley (\$3,000)

2016-2021 Berkeley Fellowship for Graduate Study, UC Berkeley (\$63,024)

2016-2018 Data Science for the 21st Century NSF Research Traineeship Program, UC Berkeley (\$2750)

2016-2017 James and Eleanor Delfino Graduate Excellence Award, UC Berkeley (\$47,765)

2014 School of Geography & the Environment Research Bursary, Oxford University (\$630)

2012-2013 Voss Environmental Fellowship, Brown University (\$3,500)

2012 Undergraduate Teaching & Research Award, Brown University

Invited presentations

Wildfires, climate change, and deforestation: Disentangling drivers of change in Anthropocene forests, *Department of Ecology, Evolution, & Organismal Biology Seminar, Brown University*, December 2024.

Advancing interdisciplinary environmental data science to understand and manage working landscapes, *Cooperative Institute for Research in Environmental Sciences Seminar Series, University of Colorado-Boulder*, February 2024.

Wildfires, climate change, and the future of forests in the western United States. *Science Briefing, Board of Trustees, University Corporation for Atmospheric Research*, October 2023.

Structural equation modeling for causal inference in ecology: reflections from a quasi-

- experimentalist, *Causality in Ecology Working Group, Johns Hopkins University*, August, 2023.
- Forest ecosystems in a changing world: wildfires, climate change, and deforestation, *Nicholas School of the Environment, Duke University*, March 2023.
- Disentangling the drivers of increased wildfire activity in working landscapes of the western US, *College of Agriculture, Food & Environmental Sciences, California Polytechnic State University-San Luis Obispo*, March 2023.
- Forest conservation in a changing world: wildfires, climate change, & deforestation, *Daniels Faculty of Architecture, Landscape, & Design, University of Toronto*, February 2023.
- Climate change and wildfires in working landscapes of the western US, *Climate Change in the Working Lands of the West Seminar Series, College of Agriculture, Food & Environmental Sciences, California Polytechnic State University-San Luis Obispo*, January 2023.
- Changing wildfire regimes impact the functional diversity of forests in the western US, *Climate and Global Change Science Seminar Series, National Oceanographic & Atmospheric Administration*, December 2022.
- The fate of working landscapes: causal analysis in social-ecological systems, *Ecology & Evolutionary Biology Seminar Series, University of Colorado-Boulder*, September 2022.
- The fate of working landscapes: causal analysis in social-ecological systems, *Biodiversity Research Centre, University of British Columbia*, February 2022.
- Econometric causal inference methods for ecology, *Lunch & Learn Seminar Series, Department of Ecology & Evolutionary Biology at University of Colorado-Boulder*, February 2022.

Conference participation

Contributed presentations

- Siegel K**, Dee L (2023) Impacts of changing wildfire regimes on tree functional traits and forests' resistance to climate change in the western United States. Ecological Society of America, Portland, Oregon.
- Siegel K** (2022) Impacts of land management and changing wildfire regimes on forest ecological functions and ecosystem services in the western United States. Fire Ecology Across Boundaries: Connecting Science and Management, Florence, Italy.
- Siegel K**, Macaulay L, Shapero M, Becchetti T, Larson S, Mashiri F, Waks L, Butsic V (2022) Impacts of livestock grazing on wildfire probability vary by region and vegetation type in California. Ecological Society of America & Canadian Society of Ecology and Evolution, Montreal, Canada.
- Siegel K** (2022) Collaborations with Cooperative Extension for use- and stakeholder-inspired wildfire science. NOAA Climate & Global Change Summer Institute, Steamboat Springs, Colorado.
- Siegel K** (2022) Impacts of land management and wildfire severity on post-fire forest composition and functioning in the western US. NOAA Climate & Global Change Summer Institute, Steamboat Springs, Colorado.
- Siegel K**, Larsen L, Stephens, C, Stewart B, Butsic V (2021) Quantifying drivers of change in social-ecological systems: land management impacts wildfire probability in forests of the western US. Ecological Society of America Annual Meeting, virtual meeting.
- Siegel K**, Mills-Novoa M, Farah Perez A, Kinnebrew E, Ochoa J, Shoffner E (2020)

Synthesizing quantitative and qualitative understandings of deforestation drivers and solutions in protected areas in the Amazon. American Association of Geographers Annual Meeting, virtual meeting.

Siegel K, Cabral R, McHenry J, Ojea E, Owashi B, Lester S (2018) Marine resource management and social-ecological vulnerability to coral bleaching in the Caribbean. *Latin America and the Caribbean Congress for Conservation Biology, St. Augustine, Trinidad & Tobago.*

Siegel K, Englander G, Errickson F, McDonald G, Kleisner K, Battista W, Couture J, Karr K, Fujita R (2018) Projecting the ecological and economic impacts of fisheries reform in Myanmar. International Marine Conservation Congress, Kuching, Malaysia.

Siegel K (2016) “Think-and-do tanks”: Building boundary organizations to connect the science and practice of marine conservation. International Marine Conservation Congress, St. John’s, Newfoundland, Canada.

Contributed posters

Englander G, Errickson F, Norman K, Tribble C, **Siegel K** (2018) Data science collaborations with conservation nonprofits. Berkeley Institute for Data Science, Berkeley, CA.

Siegel K, Lasch C, Reddy S, Leslie H (2014) Integrating ecological and institutional considerations into marine conservation planning in Mexico’s Gulf of California. International Marine Conservation Congress, Glasgow, Scotland.

Working group participation

2023-2024 “Fire impacts to ecosystem services in the US West: Does prescribed burning work, for what and for whom?” Morpho Initiative, National Center for Ecological Analysis & Synthesis, University of California-Santa Barbara (*Invited participant*)

2023 *Causal Inference in Ecology*, Johns Hopkins University (*Invited participant*)

Teaching

Instructor of Record

Spring 2024 Forest Conservation Biology, University of Toronto

Spring 2023 Causal Inference in Ecological Data, University of Colorado Boulder (Co-Instructor of Record)

Course Development

Causal Inference in Ecological Data (co-developed with Dr. Laura Dee)

Guest Lectures

Fall 2024 Ecological Systems in Design, CU Boulder

Spring 2024 Advanced Seminar in Forest Conservation, University of Toronto

Fall 2022 Working with Environmental Data, University of California-Santa Barbara

Spring 2022 Ecology, University of Colorado-Boulder

Spring 2020 Environmental Analysis Using GIS, University of California-Davis

Committees (* denotes active)

Chaired committees, CU Boulder

Danyan Leng*, PhD student in Geography, CU Boulder

Committee member, CU Boulder

Alek Berg*, PhD student in Geography, primary advisor: S. Leyk

Yuying Reng*, PhD student in Geography, primary advisor: S. Leyk

Tyler McIntosh*, PhD student in Geography and Ecology & Evolutionary Biology, primary advisors: J. Balch and L. Dee

Committee member, other universities

Nicholas Dewez, PhD student in Forestry, University of Toronto

Kennedy Korkola, PhD student in Forestry, University of Toronto

Undergraduate advising and mentoring

2024- Committee member for Ava Boettiger, senior honors student in Ecology & Evolutionary Biology, CU Boulder

2024 Supervised Centre for Global Change Science intern Kristen Huang (University of Toronto)

2022-2023 Committee member for Emily Pfaller, senior honors student in Ecology & Evolutionary Biology, CU Boulder

2022 Supervised two summer UROP students at CU Boulder

2018-2021 Supervised eleven undergraduate research assistants at University of California Berkeley

Service activities

CU Boulder

2024- Graduate Committee, Department of Geography, CU Boulder

Professional service activities

2024 Facilitator, National Science Foundation FIRE-PLAN workshop

2024 Reviewer, Mitacs Accelerate Program

2022 Judge for Ecological Society of America's Buell Award

Journal reviews

2024 *Regional Environmental Change, Journal of Environmental Management, Communications Earth & Environment, International Journal of Disaster Risk Reduction*

2023 *Methods in Ecology & Evolution, Ecology & Society, Environmental Research Letters, Land Use Policy, Journal of Environmental Management, Cogent Food & Agriculture, Science of the Total Environment, Cell Reports Sustainability*

2022 *Conservation Letters, Land Use Policy*

2021 *Nature Communications, Nature Sustainability*

2020 *Land Use Policy*

Conferences organized

Bay Area Conservation Biology Symposium, Berkeley, California, May 2019.

Conference sessions organized

- Mills-Novoa M, Kinnebrew E, **Siegel K**, Shoffner E, Ochoa J (2021) Synthesizing quantitative and qualitative understandings of deforestation drivers and solutions in protected areas in the Amazon. American Association of Geographers, virtual meeting.
- Mills-Novoa M, **Siegel K**, Shoffner E (2020) Qualitative and quantitative approaches to understanding deforestation dynamics in the Amazon Basin. American Association of Geographers, virtual meeting.
- Siegel K**, Clemence M (2016) Connecting theory and practice to advance marine conservation science and outcomes. International Marine Conservation Congress, St. John's, Newfoundland, Canada.

Additional service activities

- 2022-2023 Mentor, Strategies for Ecology Education, Diversity, and Sustainability (SEEDS) program, Ecological Society of America
- 2020-2021 Mentor, Graduate Student Mentorship Initiative, Científico Latino
- 2019-2023 Mentor, Oakland Promise/East Bay College Fund

Outreach presentations

- Siegel K**, Olvera Hernandez S, Dee L, Rodman A, Olliff T (2024). Operationalizing the Resist Accept-Direct framework to manage wildfires and forest transformations in the Greater Yellowstone. *Greater Yellowstone Coordinating Committee (virtual)*.
- Siegel K**, Larsen L, Stephens C, Stewart B, Butsic V (2023). The impact of land ownership on fire regimes in the western US. *Colorado Wildland Fire Conference, Fort Collins, CO*.
- Siegel K**, Butsic V, Herbert C, Becchetti T, Larson S, Macaulay L, Shapero M, Mashiri F (2020). Grazing and wildfire risk on federal land in California. *2020 California Rangeland Conservation Coalition Summit, Stockton, California*.

Additional professional development

- 2024 PI Academy Workshop: Avenues to External Funding (December 4)
- 2024 PI Academy Workshop: Elements of a Strong One Page Project Summary (November 6)
- 2024 PI Academy Workshop: Orientation (September 12)
- 2024 Thriving at CU Workshop: Thriving in the First Year (September 13)
- 2024 Thriving at CU Workshop: Thriving in the Classroom: Handling Challenges (October 10)
- 2020 Certificate of Teaching & Learning in Higher Education, University of California-Berkeley

Synergistic activities

- 2023 Participant, Ecological Transformation Workshop, North Central Regional Invasive Species & Climate Change Network (Participant)
- 2023 Participant, Innovation Summit, Environmental Data Science Innovation & Inclusion Lab, CU Boulder
- 2023 Participant, Forest Resilience Data Synthesis Working Group, Earth Lab, CU Boulder
- 2022 Participant, Understanding the Rules of Life Workshop, National Science Foundation