

# Brooke Fitzgerald

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Department of Agricultural and Resource Economics, Colorado State University  
301 University Ave, Fort Collins, CO, USA 80521  
Last Update: May, 2025

## EDUCATION

- **Colorado State University** *Expected 2026*  
*Ph.D. in Agricultural and Resource Economics* Fort Collins, CO, USA
- **Hampshire College** *2018*  
*B.A. in Data Science and Applied Mathematics* Amherst, MA, USA

## RESEARCH INTERESTS

**Primary:** Environmental and climate change, pollution, remote sensing, machine learning  
**Secondary:** Causal inference for environmental justice and policy.

## WORKING PAPERS

“Economic Management of Cytospora Canker using the Orchard Disease Tool” with Jane Stewart and Dana Hoag.  
*Submitted.*

## SELECTED WORKS IN PROGRESS

- “Is that Smoke in the Air? Estimating the Global Economic Cost of Smoke Exposure Using Machine Learning” with [Jesse Burkhardt](#), Kimberly Corwin, [Yawen Guan](#), [Emily Fischer](#), and [Jeffrey Pierce](#).
- “The Price of Staying In: Estimating Wildfire Smoke Avoidance Costs Using Comprehensive US Mobility and Spending Data” with [Jude Bayham](#), [Alexandra Hill](#), and [Jesse Burkhardt](#).
- “Measurement of PM2.5 from Wildfire Smoke: Implications for econometric analyses with application to agricultural worker productivity” with [Jesse Burkhardt](#), [Alexandra Hill](#), and [Jude Bayham](#)

## NON-PEER-REVIEWED PUBLICATIONS

“Engine Icing Data-An Analytics Approach.” with Ashley Flegel. *NASA Technical Report*. No. GRC-E-DAA-TN40097, May 2017. [\[Link\]](#).

## INVITED TALKS AND CONFERENCE PRESENTATIONS (\* = SCHEDULED, - = PRE-2023)

- 2025** Association for Environmental and Resource Economics Annual Meeting (Santa Ana Pueblo)\*, Agricultural and Applied Economics Association Annual Meeting (Denver)\*, The Workshop for Environmental Economics and Data Science (Portland), Front Range Energy and Environmental Economics Workshop (Boulder), Environmental and Resource Economics Lab Seminar (Colorado State University), Joint University of Wyoming and Colorado State University Graduate Research Seminar (Colorado State University)
- 2024** Agricultural and Applied Economics Association Annual Meeting (New Orleans), Western Fruit and Horticultural Society Annual Meeting (Grand Junction), Environmental and Resource Economics Lab Seminar (Colorado State University), Joint University of Wyoming and Colorado State University Graduate Research Seminar (Colorado State University)
- 2023-** Western Agricultural Economics Association Annual Meeting (Whistler, Canada), Western Fruit and Horticultural Society Annual Meeting (Grand Junction), Environmental and Resource Economics Lab Seminar (Colorado State University), Society for Industrial and Applied Mathematics Conference on Data Mining (Calgary)

## PATENTS

- 2022** “Systems and methods for managing and controlling electronic messaging campaigns.” U.S. Patent Application 16/930,916, with Kyle Tate and Pascal Potvin.
- 2022** “Systems and methods for controlling electronic message transmissions.” U.S. Patent 11,368,422 with Mary-Juen Sohn and Tengke Xiong.
- 2022** “Systems and methods for dynamic messaging campaign.” U.S. Patent 11,270,355 with Kevin Clark, David Cornu, and Jacinthe Ricard.

## HONORS, GRANTS, AND AWARDS

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**2023-2025** Best Graduate Poster – Department of Agricultural and Resource Economics, Colorado State University

**2022-2025** Graduate Teaching / Research Assistant – Department of Agricultural and Resource Economics, CSU

**2018** Lorna M. Petersen Prize for Collaborative Research – 5 College Consortium, Amherst, MA

**2017** Best Hampshire College Statistics Student – 5 College Consortium, Amherst, MA

## PROFESSIONAL SERVICE

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Co-Organizer of the PhD Economics Seminar at the University of Wyoming and Colorado State University – 2023-2025,  
Graduate Liaison for Women in Economics in the Department Agricultural and Resource Economics at CSU – 2024-2025,  
GSC Representative for the Department Agricultural and Resource Economics at Colorado State University – 2025

## TEACHING EXPERIENCE

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### Materials Developer / Guest Lecturer

**2024-2025** Colorado State University  
PhD: Econometric Theory II (2x)

**pre-2022** Five College Consortium and Hampshire College  
UG: Frontiers in Biomathematics

### Teaching Assistant

**2022-2025** Colorado State University  
PhD: Econometric Theory II (2x)  
UG: Energy Economics, Agricultural Policy

**pre-2022** Hampshire College  
UG: Calculus I & II, Dynamical Systems, Introduction to Data Science, Frontiers in Biomathematics

## PROFESSIONAL MEMBERSHIPS AND SKILLS

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Association of Environmental and Resource Economists, American Agricultural Economics Association

- **Coding:** Python, R, Stata, SQL, MATLAB, Javascript, C++,  $\text{\LaTeX}$
- **Languages:** English (native); Portuguese, Spanish (intermediate); French (basic)
- **Econometrics and Causal Inference:** Diff-in-Diff, Synthetic Control, Causal Forests
- **Machine learning:** Deep learning, unsupervised learning, tree-based methods
- **Big data analysis:** Parallel and cloud computing, PySpark, Arrow
- **Software engineering:** version control, web application development

## REFERENCES

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### Jesse Burkhardt

Associate Professor, Dept. of Agricultural & Resource Economics  
Colorado State University  
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### Jude Bayham

Associate Professor, Dept. of Agricultural & Resource Economics  
Colorado State University  
Email: [jude.bayham@colostate.edu](mailto:jude.bayham@colostate.edu)

### Alexandra Hill

Assistant Professor of Cooperative Extension,  
Dept. of Agricultural & Resource Economics  
University of California, Berkeley  
Email: [alihill@berkeley.edu](mailto:alihill@berkeley.edu)