

# Joel Ferguson

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Global Policy Lab  
Stanford University  
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Stanford, CA 94305

Compiled: 2024-10-24

## APPOINTMENTS

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### Postdoctoral Fellow

July 2024 –

Stanford University  
Environmental Social Sciences Department  
Supervisor: Solomon Hsiang

### Postdoctoral Fellow

August 2023 – June 2024

University of California, Berkeley  
Goldman School of Public Policy  
Supervisor: Solomon Hsiang

## FIELDS OF INTEREST

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Agricultural Economics, Development Economics, Urban Economics, Economic Geography, Remote Sensing, Machine Learning

## EDUCATION

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### PhD in Agricultural and Resource Economics

August 2018 – August 2023

University of California, Berkeley  
Designated Emphasis (PhD minor): Development Engineering  
Dissertation Committee: Marco Gonzalez-Navarro (Chair), Edward Miguel, Maximilian Auffhammer

### BS in Economics

August 2012 – May 2016

Tulane University

## REFERENCES

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### Solomon Hsiang

Professor, Stanford Doerr School of Sustainability  
solhsiang@stanford.edu

### Marco Gonzalez-Navarro

George Pardee Jr. Family Chair; University of California, Berkeley  
marcog@berkeley.edu

### Edward Miguel

Distinguished Professor of Economics; University of California, Berkeley  
emiguel@berkeley.edu

## JOB MARKET PAPER

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**“How Large are the Environmental Benefits of Sustainable Agriculture? Evidence from Mexico”** (with Bram Govaerts)

*Abstract:* Sustainable agricultural intensification, or increasing agricultural productivity while reducing environmental impacts, has recently been promoted as an objective for ensuring global food security in coming decades. However, there is debate in the scientific literature about whether productivity and environmental benefits observed in agronomic trials translate into real world benefits when techniques associated with sustainable intensification are practiced at scale. We study a national extension effort which promoted conservation agriculture, a technique aimed at improving soil quality, throughout the Mexican countryside starting in 2012. Using granular geographic data on technology adoption collected by extension technicians together with exogenous daily wind direction variation, we find that conservation agriculture diffusion causes to large down-wind air quality improvements and approximately 7% fewer monthly infant deaths by the end of the study period. We also provide suggestive evidence that conservation agriculture adoption leads to local increases in farmer profits and agricultural output. Our results suggest that sustainable intensification is indeed feasible in practice and that the human health benefits that arise at scale outweigh the costs of extension by an order of magnitude.

## JOURNAL ARTICLES AND CONFERENCE PROCEEDINGS

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**“Will Wealth Weaken Weather Wars?”** (2024) *AEA Papers and Proceedings*, 114. Marshall Burke, Joel Ferguson, Solomon Hsiang, and Edward Miguel

**“Survey of open science practices and attitudes in the social sciences.”** (2023) *Nature Communications* 14, 5401. Joel Ferguson, Rebecca Littman, Garret Christensen, Elizabeth Levy Paluck, Nicholas Swanson, Zenan Wang, Edward Miguel, David Birke, and John-Henry Pezzuto.

**“Incorporating High-Frequency Weather Data into Consumption Expenditure Predictions.”** (2021) *NeurIPS Machine Learning for Development 2021 Proceedings*. Anders Christensen, Joel Ferguson, and Simón Ramírez Amaya.

**“Marketing and Technology Adoption and Diffusion.”** (2020) *Applied Economics: Perspectives & Policy* 42 (1). Amir Heiman, Joel Ferguson, and David Zilberman.

## WORKING PAPERS

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**“New Evidence on the Economics of Climate and Conflict.”** (forthcoming) *Handbook on the Economics of Conflict*. Marshall Burke, Joel Ferguson, Solomon Hsiang, and Edward Miguel

**“Irrigation Infrastructure and Satellite-Measured Land Use Impacts: Evidence from the Senegal River Valley”** (with Abdoulaye Cisse, Alain De Janvry, Marco Gonzalez-Navarro, Samba Mbaye, Elisabeth Sadoulet, and Mame Mor Anta Syll)

**“Reassessing China’s Rural Reforms: The View from Outer Space”** (with Oliver Kim)

## WORKS IN PROGRESS

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**“A High-Resolution Look at Long-Run Development: Evidence from 1.3 Million Historical Aerial Photographs”** (with the Aerial History Project Team)

**“Markets and Climate Change Adaptation: Evidence From Minnesota and Wisconsin Farmland Transactions”**

**“Downscaling Aggregate Maize Yields Using Satellite Imagery and Machine Learning”** (with James Sayre and Kangogo Sogomo)

**“Re-centered Neural Networks for Non-parametric Design Based Inference of Climate Impacts”**

**“Conflict and Agricultural Land Abandonment in Africa”**

**“Privilège Exorbitant? The Developmental Effects of the CFA Franc”** (with Abdoulaye Cisse and Oliver Kim)

## OTHER PUBLICATIONS

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**“How Much Will Air Quality Improve Thanks to the San Joaquin Valley Agricultural Burning Ban?”** (2023) *ARE Update* 26(4). Joel Ferguson

**“Energy Prices, the Financial Crisis, and their Implications for Land Policies in California.”** (2019) *ARE Update* 22(6). JunJie Wu, Steven Sexton, Joel Ferguson, and David Zilberman

## GRANTS AND FELLOWSHIPS

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STEG PhD Research Grant (w/ Oliver Kim, 14,989 GBP)	2022
Fisher Center PhD Research Grant (w/ Oliver Kim, \$15,000)	2022
Clausen Center PhD Research Grant (w/ Oliver Kim, \$5,000)	2022
CEGA Development Challenge Grant (w/ Oliver Kim, \$14,000)	2021
InFEWS NSF Fellowship Funding (\$34,000 + 1 year tuition & fees)	2020
Federal Language and Area Studies Fellowship (Brazil; \$10,000)	2014

## WORK EXPERIENCE

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Causal Inference Economist Intern at Amazon	June 2022 – September 2022
Stanford Law Empirical Research Fellowship	October 2016 – July 2018

## AWARDS AND HONORS

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InFEWS Fellowship	2019
Summa Cum Laude Graduation Honors	2016
Tulane Undergraduate Mathematical Economics Award	2016
Phi Beta Kappa Honor Society	2016

## PRESENTATIONS AND WORKSHOPS

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### 2024

Ohio State University Agricultural, Environmental, and Development Economics Seminar; Population Association of America Annual Meeting; Agricultural and Applied Economics Association Annual Meeting; SPIA Fest; International Conference of Agricultural Economists; Urban Economics Association North American Meeting; Online Summer Workshop in Environmental, Energy, and Transportation Economics; Southern Economics Association Annual Meeting; North East Universities Development Consortium

### 2023

Heartland Environmental and Resource Economics Workshop; The Workshop on Environmental Economics and Data Science; Measuring Development; American Geophysical Union Annual Meeting; North East Universities Development Consortium

2022

The Workshop on Environmental Economics and Data Science; Machine Learning in Economics Summer Institute; CEGA Global Workshop

2021

NeurIPS Machine Learning for Development; Association of Environmental and Resource Economists Summer Conference; CGIAR SPIA Webinar Series; Pacific Conference for Development Economics; Online Summer Workshop in Environmental, Energy, and Transportation Economics

2020

Young Economist Symposium; Giannini Foundation of Agricultural and Resource Economics Student Conference

## SERVICE

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Global Policy Lab Social Chair	2024
Environmental Economics and Policy Honors Thesis Co-Advisor for Yuli (Shirly) Xue	2022-2023
Giannini Agricultural and Resource Economics Student Conference Co-Organizer	2022
Berkeley Environmental Economics and Policy Students Mentor	2021-2022
Economists for Equity at Berkeley High School Outreach Committee	2021-2022
UC Berkeley ARE Faculty Search Committee Student Representative	2021-2022
UC Berkeley ARE PhD Admissions Committee	2020-2021
UC Berkeley ARE Diversity, Equity, and Inclusion Undergraduate Outreach Subcommittee	2020-2022
InFEWS Student Council	2020-2022

## REFEREEING

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PNAS, American Journal of Agricultural Economics, Journal of Development Economics, Journal of Health Economics, Climate Change Economics

## SKILLS

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Python, R, Google Earth Engine, QGIS, Stata, SQL/POSTGRES,  $\text{\LaTeX}$

## PROFESSIONAL AFFILIATIONS

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Association of Environmental and Resource Economists, Agricultural and Applied Economics Association, American Geophysical Union, International Association of Agricultural Economists