

Minghao Qiu

Department of Earth System Science, Stanford University

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EMPLOYMENT

Postdoctoral Fellow in Planetary Health and Human health, Department of Earth System Science and Center for Innovation in Global Health, Stanford University Oct 2022 - present

Postdoctoral Scholar, Department of Earth System Science, Stanford University Oct 2021 - Sep 2022

Advisor: Marshall Burke

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA Sep 2016 - Sep 2021

Ph.D., Institute for Data, Systems, and Society (Focus: Environmental Science and Policy)

Thesis committee: Noelle E. Selin (advisor), Valerie J. Karplus, Corwin M. Zigler, Colette L. Heald

Thesis title: Impacts of Energy and Environmental Policies on Air Quality: Bridging Observational Data, Statistical, and Atmospheric Models

Selected PhD courses: Econometric; Statistical machine learning; Environmental modeling; Atmospheric chemistry; Microeconomics; Probability; Optimization.

Peking University, Beijing, China Sep 2012 - Jul 2016

B.S., Environmental Sciences, and B.A., Economics

RESEARCH EXPERIENCE

Stanford University, Stanford, CA Oct 2021 - present

- Evaluate effects of drought on energy systems, air quality, and human health.
- Climatic drivers and human impacts of wildfire PM_{2.5} pollution.

Massachusetts Institute of Technology, Cambridge, MA Sep 2016 - Sep 2021

- Evaluate the ability of statistical models to correct for meteorological variability when estimating causal impacts of policy on air quality and human health; design a new machine learning approach that reduced estimation bias by 60% compared to widely-used regression methods.
- Estimate the effects of wind power on air quality, health, and environmental justice in the US with causal inference, GEOS-Chem and adjoint model; perform cost-benefit analyses of wind power at the state level.
- Examine the causal effects of China's energy efficiency and SO₂ policies on air quality and health at the firm-level.

International Institute for Applied Systems Analysis, Austria Jun 2019 - Sep 2019

Researcher, Young Scientists Summer Program (advised by Dr. Jens Borken-Kleefeld)

- Develop the first statistical method to estimate average emission factors of diesel vehicles with instantaneous measurements from remote sensing.

University of California, Berkeley, Berkeley, CA

Jun 2015 - Oct 2015

Visiting Student Researcher, Atmospheric Chemistry Group (advised by Prof. Ronald Cohen)

Peking University, Beijing, China

Jan 2015 - Jul 2016

Research Assistant, College of Urban and Environmental Sciences (advised by Prof. Junfeng Liu)

PUBLICATIONS

Under review, submitted, in preparation

Paul Picciano, Sebastian Eastham, **Minghao Qiu**, Mei Yuan, John Reilly, Noelle E. Selin. Air Quality-Related Equity Implications of U.S. Decarbonization Policy. (*submitted*)

Minghao Qiu, Nathan Ratledge, Ines Azevedo, Noah Diffenbaugh, Marshall Burke. Impacts of drought on electricity system and air quality in the western US. (*in preparation*) [[AGU abstract](#)]

Minghao Qiu, Jessica Li, Jeff Wen, Marissa Childs, Marshall Burke. Impacts of climate change on wildfire smoke exposure over the continental US at the census tract level. (*in preparation*) [[AGU abstract](#)]

Peer Reviewed

1. **Minghao Qiu**, Cory Zigler, Noelle Selin. Impacts of wind power on air quality, premature mortality and exposure disparities in the US. *in press, Science Advances*, 2022
2. Marissa Childs, Jessica Li, Jeff Wen, Anne Driscoll, Sherrie Wang, Carlos Gould, **Minghao Qiu**, Jen Burney & Marshall Burke. Daily local-level estimates of ambient wildfire smoke PM_{2.5} for the contiguous US. *Environmental Science and Technology*, 2022 [[Link](#)]
3. **Minghao Qiu**, Cory Zigler, Noelle Selin. Statistical and machine learning methods for evaluating trends in air quality under changing meteorological conditions. *Atmospheric Chemistry and Physics*, 2022 [[Link](#)]
4. **Minghao Qiu**, Jens Borken-Kleefeld. Using snapshot measurements to identify high-emitting vehicles. *Environmental Research Letters*, 2022 [[Link](#)]
5. **Minghao Qiu**, Yangqin Weng, Jing Cao, Noelle Selin, Valerie Karplus. Improving evaluation of energy policies with multiple goals: Comparing *ex ante* and *ex post* approaches *Environmental Science and Technology*, 2020 [[Link](#)]
6. Haozhe Yang, Wei Tao, Ying Liu, **Minghao Qiu**, Junfeng Liu, Kejun Jiang, Kan Yi, Yao Xiao, Shu Tao. The contribution of the Beijing, Tianjin and Hebei region's iron and steel industry to local air pollution in winter. *Environmental Pollution*, 2018 [[Link](#)]
7. Kai Wei, **Minghao Qiu**, Rongfei Zhang, Liantong Zhou, Ting Zhang, Maosheng Yao, and Chunxiong Luo. Single Living yEast PM Toxicity Sensor (SLEPTor) System. *Journal of Aerosol Science*, 2017 [[Link](#)]

CONFERENCE AND SEMINAR PRESENTATIONS

1. Statistical and machine learning methods for evaluating trends in air quality under changing meteorological conditions. *AGU Atmospheric Science Section Early Career Seminar*, invited speaker, 2022
2. Challenges and opportunity in managing air pollution under a changing climate. *Peking University*, invited speaker, 2022

3. Impacts of energy and environmental policy on air quality: empirical data, statistical models, and atmospheric models. *Tsinghua University*, invited speaker, 2022
4. Statistical and machine learning methods for evaluating emissions reduction policies under changing meteorological conditions. *American Geophysical Union Fall Meeting*, invited speaker, 2021
5. Assessing impacts of energy and environmental policies on air quality in the real world. *Brandeis University*, invited speaker, 2021
6. Impacts of energy and environmental policies on air quality in the real world. *MIT Joint Program on the Science and Policy of Global Change*, invited speaker, 2021
7. Statistical and machine learning methods for evaluating emissions reduction policies under changing meteorological conditions. *American Geophysical Union Fall Meeting*, 2020
8. Evaluating quantitative techniques to assess policy impacts on air quality in changing meteorological conditions. *1st GEOS-Chem Europe Meeting*, 2020
9. Effectiveness of renewable energy policy for air pollution reductions: evidence from wind power in the US. *American Meteorological Society Annual Meeting*, Boston, 2020
10. Effectiveness of US state level climate policies: Evidence from plant level data in power sector. *Harvard/MIT ACE Center Science Advisory Committee Meeting*, Boston, 2018
11. Air Quality Co-benefits of Energy Policy: Evidence from industrial firms in China. *American Geophysical Union Fall Meeting*, New Orleans, Poster presentation, 2017

GRANTS AND AWARDS

Planetary Health Fellowship, Stanford and London School of Hygiene & Tropical Medicine (\$150,000)	2022
Outstanding Student Presentation Awards (OSPA), American Geophysical Union Fall Meeting	2021
MIT Martin Family Society of Fellows for Sustainability (\$50,000)	2020
Young Scientists Summer Program at IIASA (€3,000)	2019
MISTI Global Research Summer Fund (\$3,100)	2019
National Merit Scholarship, Ministry of Education, China	2014 - 2015

TEACHING AND MENTORING

Course contributor , MIT 6.419x <i>Data Analysis: Statistical Modeling and Computation in Applications</i>	2021
Lecturer , Public lecture on <i>Tools to reach climate targets</i> , Science in the News Network	2021
Lecturer , Public course on <i>Climate Change Policy 101</i> . MIT Joint Program on the Science and Policy of Global Change.	2017

Mentoring: summer research (1 undergrad), graduate school application assistance program (5 undergrads)

SERVICE AND PROFESSIONAL DEVELOPMENT

Session chair and organizer : American Geophysical Union Fall Meeting, 2021	
Journal and conference referee : <i>ACS Environmental Au</i> , <i>Environmental Research Letters</i> , <i>Environmental Research: Health</i> , <i>Environmental Research Communications</i> , <i>Science of the Total Environment</i> , <i>NeurIPS</i>	
MIT Social and Engineering Systems Doctoral Seminar, Coordinator	2019 - 2020
MIT Energy for Human Development, Co-President	2017 - 2019

PROFESSIONAL EXPERIENCE

World Resource Institute, Research Analyst, Beijing, China

January 2016 - July 2016

Analyzed China's decarbonization strategy under Paris Agreement for energy supply, building, industry and transportation sectors; Drafted research report "China's CO₂ Emissions Pathways and Reduction Strategies under Paris Agreement".

TECHNICAL EXPERTISE

Atmospheric modeling: GEOS-Chem, Community Earth System Model (CESM)

Statistical causal inference, Machine learning

Coding and software: R, Python, Matlab, STATA, ArcGIS

REFERENCES

Noelle Selin

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Massachusetts Institute of Technology
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Marshall Burke

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Corwin Zigler

Department of Statistics and Data Sciences
The University of Texas at Austin
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Valerie Karplus

Department of Engineering and Public Policy
Carnegie Mellon University
vkarplus@andrew.cmu.edu

Jens Borken-Kleefeld

Technische Universität Dresden & International Institute for Applied Systems Analysis (IIASA)
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