Minghao Qiu

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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 (Advisor: Marshall Burke)   Oct 2022 - present
Postdoctoral Scholar, Department of Earth System Science, Stanford University   Oct 2021 - Sep 2022

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 trends in air quality; 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.
- Examine the causal effects of China's energy and SO_2 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 (advisor: 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 (advisor: Ronald Cohen)

Peking University, Beijing, China   Jan 2015 - Jul 2016
Research Assistant, College of Urban and Environmental Sciences (advisor: Junfeng Liu)

PUBLICATIONS

Under review, submitted, in preparation

Haitong Zhe Sun et al. Antagonism between ambient ozone increasing and urbanisation-oriented population migration on Chinese cardiopulmonary mortality. *(submitted)*

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

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. (2022). Impacts of wind power on air quality, premature mortality and exposure disparities in the US. ***Science Advances***, 8(48), eabn8762 [Link]

2. Marissa Childs, Jessica Li, Jeff Wen, Anne Driscoll, Sherrie Wang, Carlos Gould, **Minghao Qiu**, Jen Burney & Marshall Burke. (2022). Daily local-level estimates of ambient wildfire smoke $PM_{2.5}$ for the contiguous US. ***Environmental Science and Technology***, 56(19), 13607-13621 [Link]

3. **Minghao Qiu**, Cory Zigler, Noelle Selin. (2022). Statistical and machine learning methods for evaluating trends in air quality under changing meteorological conditions. ***Atmospheric Chemistry and Physics***, 22(16), 10551-10566 [Link]

4. **Minghao Qiu**, Jens Borken-Kleefeld. (2022). Using snapshot measurements to identify high-emitting vehicles. ***Environmental Research Letters***, 17(4), 044045 [Link]

5. **Minghao Qiu***, Yangqin Weng*, Jing Cao, Noelle Selin, Valerie Karplus. (2020). Improving evaluation of energy policies with multiple goals: Comparing *ex ante* and *ex post* approaches ***Environmental Science and Technology***, 54(24), 15584-15593 [Link]

6. Haozhe Yang, Wei Tao, Ying Liu, **Minghao Qiu**, Junfeng Liu, Kejun Jiang, Kan Yi, Yao Xiao, Shu Tao. (2018). The contribution of the Beijing, Tianjin and Hebei region's iron and steel industry to local air pollution in winter. ***Environmental Pollution***, 245, 1095-1106 [Link]

7. Kai Wei, **Minghao Qiu**, Rongfei Zhang, Liantong Zhou, Ting Zhang, Maosheng Yao, and Chunxiong Luo. (2017). Single Living yEast PM Toxicity Sensor (SLEPTor) System. ***Journal of Aerosol Science***, 107, 65-732 [Link]

* denotes equal contribution

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 *Data Analysis: Statistical Modeling and Computation in Applications* 2021
Lecturer, Public lecture on *Tools to reach climate targets*, Science in the News Network 2021
Lecturer, Public course on *Climate Change Policy 101*. 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: *ACS Environmental Au, Environmental Health Perspectives, Environmental Research Letters, Environmental Research: Health, Environmental Research Communications, PNAS, Science of the Total Environment, NeurIPS*

MIT Social and Engineering Systems Doctoral Seminar, Coordinator 2019 - 2020

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 CO_2 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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Department of Earth System Science and Center on Food Security and the Environment
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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
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Jens Borken-Kleefeld
Technische Universitt Dresden & International Institute for Applied Systems Analysis (IIASA)
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