

Minghao Qiu

minghao.qiu@stonybrook.edu ◇ (+1) 857-253-9431 ◇ website: <https://mhqiu.github.io/>

School of Marine and Atmospheric Science and Program in Public Health

125 Discovery Hall, Stony Brook University

updated: December, 2024

EMPLOYMENT

Assistant Professor, School of Marine and Atmospheric Science and Program in Public Health,
Stony Brook University, NY, USA Sep 2024 - present

Postdoctoral Fellow in Planetary Health and Human health, Doerr School of Sustainability and Center for
Innovation in Global Health, Stanford University (Advisor: Marshall Burke) Oct 2021 - Aug 2024

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

Peking University, Beijing, China Sep 2012 - Aug 2016

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

RESEARCH INTERESTS

Air quality – climate interactions; Wildfire and air quality; Climate and air pollution effects on human health;
Energy and climate policy evaluations;

PUBLICATIONS

[^] equal contribution

Under review, submitted, in preparation

Minghao Qiu, Christopher W. Callahan, Noah S. Diffenbaugh, Marshall Burke. Estimating the social cost
of carbon in climate-induced wildfire smoke damages. (*in preparation*)

Marissa Childs, Mariana Martins, Andrew J. Wilson, Sam Heft-Neal, **Minghao Qiu**, Marshall Burke. Growing
wildfire-derived PM_{2.5} across the contiguous U.S. and implications for air quality regulation. (*submitted*)

Makoto Kelp, Marshall Burke, **Minghao Qiu**, Ivan Higuera-Mendieta, Tianjia Liu, and Noah Diffenbaugh.
Efficacy of Recent Prescribed Burning and Land Management on Wildfire Burn Severity and Smoke Emissions
in the Western United States. (*under review*)

Qingyang Wu, Linshuang Yang, Xinyu Dou, **Minghao Qiu**. Carbon Capitalism in China: Does Carbon
Emission Trading Widen the Divide of Carbon Emission Inequality? (*under review*)

Revise & Resubmit

Arpita Biswas, **Minghao Qiu**, Danielle Braun, Francesca Dominici, Daniel Mork. Quantifying Effects of Solar
Power Adoption on CO₂ Emissions Reduction. (*revise & resubmit, Science Advances*)

Emma Krasovich Southworth, **Minghao Qiu**, Carlos F. Gould, Ayako Kawano, Jeff Wen, Sam Heft-Neal, Kara Kilpatrick Voss, Alandra Lopez, Scott Fendorf, Jennifer Burney, Marshall Burke. Quantifying the chemical composition and health implications of wildfire smoke PM_{2.5} in the contiguous US. (*revise & resubmit, Environmental Science & Technology*)

Renzhi Jing, Sam Heft-Neal, Zetianyu Wang, Jie Chen, **Minghao Qiu**, Isaac M. Opper, Zachary Wagner, Eran Bendavid. Loss of Schooling from Tropical Cyclones: Evidence from 13 Low- and Middle-income Countries. (*revise & resubmit, PNAS*)

Minghao Qiu, Gang He, Peter Marcotullio. Health and climate benefits of power generation from imported solar photovoltaic in the United States. (*revise & resubmit, One Earth*)

Minghao Qiu, Jessica Li, Carlos Gould, Renzhi Jing, Makoto Kelp, Marissa Childs, Jeff Wen, Yuanyu Xie, Meiyun Lin, Mathew Kiang, Sam Heft-Neal, Noah S Diffenbaugh, Marshall Burke. Wildfire smoke exposure and mortality burden in the US under future climate change. (*revise & resubmit, Nature*) [[preprint](#)] [[NBER Working Paper](#)]

Peer Reviewed

16. Ayako Kawano, Makoto Kelp, **Minghao Qiu**, Kirat Singh, Eeshan Chaturvedi, Ines Azevedo, Marshall Burke. Improved daily PM_{2.5} estimates in India reveal inequalities in recent enhancement of air quality. *accepted, Science Advances* (2024) [[preprint](#)]
15. **Minghao Qiu**, Makoto Kelp, Sam Heft-Neal, Xiaomeng Jin, Carlos F. Gould, Daniel Tong, Marshall Burke. Evaluating chemical transport and machine learning models for wildfire smoke PM_{2.5}: Implications for assessment of health impacts. *Environmental Science & Technology* (2024) [[Link](#)]
14. Shan Niu[^], **Minghao Qiu**[^], Li Li, Chenfei Qu, Da Zhang. Climate Actions, Persistent Pollutants, and Human Health: A Call for Integrated Assessments *Environmental Science & Technology*, 58, 36, 15885 - 15887 (2024)[[Link](#)]
13. Guochao Chen, **Minghao Qiu**, Peng Wang, Yuqiang Zhang, Drew Shindell, Hongliang Zhang. Continuous wildfires threaten public and ecosystem health under climate change across continents. *Front. Environ. Sci. Eng. (FESE)*, 18(10): 130 (2024) [[Link](#)]
12. Maja Schlter, Christa Brelsford, Paul J Ferraro, Kirill Orach, **Minghao Qiu**, Martin D Smith. Unraveling complex causal processes that affect sustainability requires more integration between empirical and modeling approaches. *Proceedings of the National Academy of Sciences*, 120(41), e2215676120. (2023) [[Link](#)]
11. Haitong Zhe Sun, Junchao Zhao, Xiang Liu, **Minghao Qiu**, Huizhong Shen, Serge Guillas, Chiara Giorio, Zosia Staniaszek, Pei Yu, Michelle W L Wan, Man Mei Chim, Kim Robin van Daalen, Yilin Li, Zhenze Liu, Mingtao Xia, Shengxian Ke, Haifan Zhao, Haikun Wang, Kebin He, Huan Liu, Yuming Guo, Alexander T Archibald. Antagonism between ambient ozone increasing and urbanisation-oriented population migration on Chinese cardiopulmonary mortality. *The Innovation* (2023) [[Link](#)]
10. Marshall Burke, Marissa L. Childs, Brandon de la Cuesta, **Minghao Qiu**, Jessica Li, Carlos F. Gould, Sam Heft-Neal, Michael Wara. Wildfire influence on recent US pollution trends. *Nature* (2023) [[Link](#)]
Press coverage: [WSJ](#), [NYTimes](#) [Stanford News](#)
9. Paul Picciano[^], **Minghao Qiu**[^], Sebastian Eastham, Mei Yuan, John Reilly, Noelle E. Selin. Air Quality Related Equity Implications of U.S. Decarbonization Policy. *Nature Communications*, 14, 5543 (2023) [[Link](#)]
Press coverage: [MIT News](#)
8. **Minghao Qiu**, Nathan Ratledge, Ines Azevedo, Noah Diffenbaugh, Marshall Burke. Drought impacts on the electricity system, emissions, and air quality in the western US. *Proceedings of the National Academy of Sciences*, 120(28), e2300395120. (2023) [[Link](#)]

[Young Professional Best Paper Award](#), US Association for Energy Economics 2023

Press coverage: [Stanford News](#), [the Hill](#), [AGU Eos](#), [The Seattle Times](#), [New Scientist](#), [Grist](#)

7. **Minghao Qiu**, Cory Zigler, Noelle Selin. Impacts of wind power on air quality, premature mortality and exposure disparities in the US. *Science Advances*, 8(48), eabn8762 (2022) [\[Link\]](#)

Press coverage: [MIT News](#), [US News & World Report](#), [HealthDay](#), [The Verge](#)

6. 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*, 56(19), 13607-13621 (2022) [\[Link\]](#)

Press coverage: [NYTimes](#), [Guardian](#), [SFChronicle](#)

5. **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*, 22(16), 10551-10566 (2022) [\[Link\]](#)
4. **Minghao Qiu**, Jens Borken-Kleefeld. Using snapshot measurements to identify high-emitting vehicles. *Environmental Research Letters*, 17(4), 044045 (2022) [\[Link\]](#)
3. **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*, 54(24), 15584-15593 (2020) [\[Link\]](#)
2. 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*, 245, 1095-1106 (2018). [\[Link\]](#)
1. 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*, 107, 65-732 (2017). [\[Link\]](#)

GRANTS AND AWARDS

| | |
|--|-------------|
| 2024 Cohort of GeoCAFE scholars (20 early-career scientists supported by NSF Research Coordination Network on Climate Change and Health) | 2024 |
| Young Professional Best Paper Award, US Association for Energy Economics | 2023 |
| Winner of Poster Competition, Meteorology and Climate - Modeling for Air Quality (MAC-MAQ) Conference | 2023 |
| Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCESSS XVII) | 2023 |
| 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 |

CONFERENCE AND SEMINAR PRESENTATIONS

20. Harvard Radcliffe Institute Symposium on Power Shift: Energy Innovation, Sustainability, and Equity, *Harvard University*, invited panelist, 2024
19. Wildfire smoke exposure and mortality burden in the US under future climate change. *U.S. Environmental Protection Agency, NCEE*, invited speaker, 2024
18. Wildfire smoke exposure and mortality burden in the US under future climate change. *the University of New Mexico*, invited speaker, 2024
17. Wildfire smoke PM_{2.5} exposure and health burdens over the US under future climate. *AGU Fall Meeting*, oral presentation, 2023

16. How to estimate PM_{2.5} attributable to wildfire smoke: comparison between estimates from chemical transport models and satellite-derived machine learning methods. *AGU Fall Meeting*, poster presentation, 2023
15. Climate change impacts on air quality and human health: energy system and wildfire. *Brookhaven National Lab*, invited speaker, 2023
14. *US Association for Energy Economics*, award winner, 2023
13. Impacts of historical and future drought on the energy system and air quality in the western US. *AGU Fall Meeting*, oral presentation, 2022
12. Impacts of climate change on wildfire smoke exposure over the continental US at the census tract level. *AGU Fall Meeting*, poster presentation, 2022
11. 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
10. Challenges and opportunity in managing air pollution under a changing climate. *Peking University*, invited speaker, 2022
9. Impacts of energy and environmental policy on air quality: empirical data, statistical models, and atmospheric models. *Tsinghua University*, invited speaker, 2022
8. Statistical and machine learning methods for evaluating emissions reduction policies under changing meteorological conditions. *AGU Fall Meeting*, invited speaker, 2021
7. 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
5. Statistical and machine learning methods for evaluating emissions reduction policies under changing meteorological conditions. *AGU Fall Meeting*, 2020
4. Evaluating quantitative techniques to assess policy impacts on air quality in changing meteorological conditions. *1st GEOS-Chem Europe Meeting*, 2020
3. Effectiveness of renewable energy policy for air pollution reductions: evidence from wind power in the US. *American Meteorological Society Annual Meeting*, Boston, 2020
2. 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
1. Air Quality Co-benefits of Energy Policy: Evidence from industrial firms in China. *AGU Fall Meeting*, New Orleans, poster presentation, 2017

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, 2 master students), graduate school application assistance program (5 undergrads)

SERVICE AND PROFESSIONAL DEVELOPMENT

Session chair and organizer: American Geophysical Union Fall Meeting (2021, 2024) American Meteorological Society Meeting (2024)

Journal and conference referee: *Atmospheric Chemistry and Physics*, *ACS Environmental Au*, *Earth's Future*, *Environmental Development and Sustainability*, *Environmental Health Perspectives*, *Environmental*

Pollution, Environmental Research Letters, Environmental Research: Health, Environmental Research Communications, Environmental Science and Technology, Geohealth, Journal of the American Heart Association, Nature Communication, Nature Cities, PNAS, Science Advances, Science of the Total Environment, NeurIPS.

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

Institute for Data, Systems and Society and Department of Earth, Atmospheric and Planetary Sciences
Massachusetts Institute of Technology
selin@mit.edu

Marshall Burke

Doerr School of Sustainability and Center on Food Security and the Environment
Stanford University
mburke@stanford.edu

Corwin Zigler

Department of Statistics and Data Sciences
The University of Texas at Austin
cory.zigler@austin.utexas.edu

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)
jens.borken-kleefeld@tu-dresden.de