Minghao Qiu

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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

student or postdoc advisees are underlined; # equal contribution

Under review, submitted

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 CO_2 Emissions Reduction. *(revise & resubmit, Science Advances)*

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

18. **Minghao Qiu**, Deyang Chen, Makoto Kelp, Jing Li, Guanyu Huang, and Mahdieh Danesh Yazdi. The rising threats of wildland-urban interface fires in the era of climate change: The Los Angeles 2025 fires. *The Innovation*: 100835. (2025) [Link]

17. 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 PM2.5 in the contiguous US. *Environmental Science and Technology* (2025) [Link]

16. Ayako Kawano, Makoto Kelp, **Minghao Qiu**, Kirat Singh, Eeshan Chaturvedi, Ines Azevedo, Marshall Burke. Improved daily PM2.5 estimates in India reveal inequalities in recent enhancement of air quality. *Science Advances*, 11(4), eadq1071. (2025) [Link] [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 and Technology*, 58(52), 22880-22893. (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 and 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 Schluter, 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 (PNAS)*, 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*, 4(6). (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*, 622(7984), 761-766. (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 (PNAS), 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 PM2.5 exposure and health burdens over the US under future climate. *AGU Fall Meeting*, oral presentation, 2023
16. How to estimate PM2.5 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 Assosication 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:
At Stony Brook University:
Deyang Chen (PhD, 2024-) Yangmingkai Li (RA, 2024-2025)

Before Stony Brook University: summer research (1 undergrad, 2 master students, 2 PhD students at Stanford), 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 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

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