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, 2025

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

ACADEMIC APPOINTMENT

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,
Stanford University (Advisor: Marshall Burke) — Oct 2021 - Aug 2024

RESEARCH INTERESTS

- Climate – Air Pollution – Health Nexus
- Wildfire and air quality
- Health impacts of extreme weather
- Energy and climate policy evaluations

PUBLICATIONS

★ led by Qiu and his group (first, co-first, corresponding, or senior author).

student or postdoc advisees are underlined; # equal contribution; * corresponding author (if not first)

Under review, submitted

Deyang Chen, Mustafa Zahid, **Minghao Qiu***. Characterizing the compound extreme temperature and PM2.5 pollution events at the global scale *(submitted)*.

Min Zhang, Juan P. Wisnivesky, **Minghao Qiu**, Mahdieh Danesh Yazdi, Rosalind J. Wright, Joel D. Schwartz, Christine C. Ekenga, Robert O. Wright, Yaguang Wei. Long-term exposure to wildfire smoke PM2.5 and survival of older lung cancer patients. *(submitted)*

Mahdieh Danesh Yazdi, Nozomi Sasaki, **Minghao Qiu**, Guanyu Huang, Perry E. Sheffield. The Effect of Wildfire Air Pollution on Local Hospital Admissions in New York. *(submitted)*

Marshall Burke, Andrew J. Wilson, Tumenkhusel Avirmed, Jonas Wallstein, Mariana C. M. Martins, Patrick Behrer, Christopher W. Callahan, Marissa Childs, June Choi, Karina French, Carlos F. Gould, Sam Heft-Neal,

Renzhi Jing, **Minghao Qiu**, Lisa Rennels, Emma Krasovich Southworth. Understanding and Addressing Temperature Impacts on Mortality. *(submitted).* [NBER Working Paper]

Min Zhang, Edgar Castro, **Minghao Qiu**, Mahdieh Danesh Yazdi, Boyuan Li, Rosalind J. Wright, Joel D. Schwartz, Robert O. Wright, Yaguang Wei. Cardiopulmonary hospitalization risks from wildfire and non-wildfire $PM_{2.5}$ in 20 US states. *(submitted)*

Jinting Guo, Ning Kang, Jianyu Deng, **Minghao Qiu**, Tao Xue. A method to estimate health effects based on error-prone simulated environmental exposure: an application to a multi-country study on birthweight and fine particulate matter. *(submitted)*

Rachel Connolly, Jenny T. Nguyen, Aron Walker, Joseph Wilkins, Yiqun Ma, Rosana Aguilera, Chen Chen, Alexander Gershunov, Joan A. Casey, **Minghao Qiu**, Danlu Zhang, Yang Liu, Tarik Benmarhnia, Michael Jerrett, Miriam E. Marlier. A comparative analysis of wildfire smoke PM2.5 exposure estimates across California from 2008-2018. *(submitted)*

Alexander S. Honeyman, **Minghao Qiu**, Newton Nguyen, Alireza Namayandeh, Emma Krasovich Southworth, Marshall Burke, Scott Fendorf. Invisible and Far-Reaching Threat of Metal Toxins from Wildfire Smoke. *(submitted)*

Rui Li, Yubing Shen, Yumeng Shao, Jiaxin Ma, Gehui Wang, **Minghao Qiu**, Yuan Wang. Significant increases in health risks from fire-sourced $PM_{2.5}$ and O_3 in India and China under future climate change. *(submitted)*

Ting-Hsuan Chang, **Minghao Qiu**, Yaguang Wei, Xiao Wu. Evaluating differential air quality impacts of prescribed fire and wildfire in the United States. *(submitted)*

Kaifang Luo, Yun Li, Guochao Chen, **Minghao Qiu**, Froylan E Sifuentes, Hongliang Zhang, Gang He. Health and climate benefits of solar photovoltaic in European countries and the role of imports. *(submitted)*

Revise & Resubmit

Yangmingkai Li, Xiaomeng Jin, Makoto Kelp, Haitong Z. Sun, **Minghao Qiu***. Growing impacts of fire smoke on ozone pollution and associated mortality burden in the United States. *(revise & resubmit, Science Advances)*

Minghao Qiu, Christopher W. Callahan, Ivn Higuera-Mendieta, Lisa Rennels, Bryan Parthum, Noah S. Diffenbaugh, Marshall Burke. Valuing wildfire smoke related mortality benefits from climate mitigation. *(revise & resubmit, PNAS)* [NBER Working Paper] Press coverage: Bloomberg

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. *(revise & resubmit, Science Advances)*

Peer Reviewed

★27. Yuanhong Ma[#], **Minghao Qiu**[#], Yuan Wang, Jiaofeng Pan, Jianfeng Guo, Fu Gu, Xitong Li. Electric vehicle usage reduces urban air pollution: Insights from multi-year nationwide charging records in China. *(accepted, Nature Cities)*

26. Lingzhi Chu, Pin Wang, **Minghao Qiu**, Azar M. Abadi, Kai Chen. Extreme Weather Events and Their Health Impacts: International Variation. *(accepted, Annual Reviews in Public Health)*

★25. **Minghao Qiu**, Marshall Burke. Wildfire smoke and its harmful effects will worsen with climate change. *Nature* (invited research briefing). (2025) [Link]

★24. **Minghao Qiu**, Gang He, Peter Marcotullio. Health and climate benefits of power generation from imported solar photovoltaic in the United States. *One Earth*, 101467, DOI: 10.1016/j.oneear.2025.101467. (2025) [Link]

★23. **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. *Nature*, 1-3. (2025) [Link]

Press coverage: Washington Post, New York Times, NPR, the Guardian, Stony Brook University News

22. Shangwei Liu, Gang He, **Minghao Qiu**, and Daniel M. Kammen. Can China break the cost curse of nuclear power? *Nature*, 643, no. 8074: 1186-1188. (2025) [Link]

Press coverage: New York Times The Economist

21. Arpita Biswas, **Minghao Qiu**, Danielle Braun, Francesca Dominici, Daniel Mork. Quantifying Effects of Solar Power Adoption on CO_2 Emissions Reduction. *Science Advances*, 11, no. 31: eadq5660. (2025) [Link]

Press coverage: Stony Brook University News

20. Makoto Kelp, Marshall Burke, **Minghao Qiu**, Ivan Higuera-Mendieta, Tianjia Liu, and Noah Diffenbaugh. Effect of Recent Prescribed Burning and Land Management on Wildfire Burn Severity and Smoke Emissions in the Western United States. *AGU Advances*, 6(3) e2025AV001682. (2025) [Link]

19. Renzhi Jing, Sam Heft-Neal, Zetianyu Wang, Jie Chen, **Minghao Qiu**, Isaac M. Opper, Zachary Wagner, Eran Bendavid. Decreased likelihood of schooling as a consequence of tropical cyclones: Evidence from 13 low- and middle-income countries. *Proceedings of the National Academy of Sciences (PNAS)*, 122(18) e2413962122. (2025) [Link]

★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

Minghua Zhang Faculty Career Catalyst Award ($43,000), Stony Brook University	2025
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

INVITED PRESENTATIONS

2025: Environmental Defense Fund, Stanford University, AGU Geohealth Quarterly Seminar, BUSPH-HSPH CAFE Research Coordinating Center
2024: Harvard Radcliffe Institute, EPA National Center for Environmental Economics, Climate Impact Lab, University of New Mexico, University of Texas Arlington, City University of New York
2023: US Association for Energy Economics, MIT, Stony Brook University, City University of New York, University of Miami, Brookhaven National Lab
2022: AGU Atmospheric Science Section Early Career Seminar, Peking University, Tsinghua University, Brandeis University

TEACHING AND MENTORING

Teaching at Stony Brook University:
MAR 527 Current Issues in Climate Change (Fall 2025)
MAR 570 Modern Method of Multivariate Data Analysis in Atmospheric and Ocean Sciences (Fall 2025)

Mentoring:
At Stony Brook University:
Deyang Chen (PhD, 2024-) Xinyi Zhou (PhD, 2025-) Yangmingkai Li (RA, 2024-2025) Jiaowei Gong (RA, 2025-) Lia Sohn (RA, 2025-)

Before Stony Brook University: At Stanford: 1 undergrad summer intern, 2 master students, 2 PhD students; Graduate school application assistance program at MIT (5 undergrads).

SERVICE AND PROFESSIONAL DEVELOPMENT

Session chair and organizer: American Geophysical Union Fall Meeting (2021, 2024) American Meteorological Society Meeting (2024) International Society for Environmental Epidemiology (2025)
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 Geophysical Research - Atmospheres, Journal of the American Heart Association, Nature Communications, Nature Cities, Nature Geoscience, PNAS, Science Advances, Science of the Total Environment, NeurIPS.*

AGU Geohealth Section Committee on Communications and Outreach, Co-chair 2025-
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

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
School of Public Health
Brown University
corwin_zigler@brown.edu

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

Jens Borken-Kleefeld
Technische Universitt Dresden & International Institute for Applied Systems Analysis (IIASA)
jens.borken-kleefeld@tu-dresden.de