613A Davis Hall
Berkeley, CA 94720

Libby H. Koolik

(561) 703-8395
koolik@berkeley.edu

EDUCATION

2021-2026 *(expected)* — **Doctor of Philosophy in Environmental Engineering** — Berkeley, CA
University of California, Berkeley
Advisor: Dr. Joshua Apte
Dissertation Committee: Drs. Joshua Apte, Robert Harley, Cesunica Ivey, Rachel Morello-Frosch

2018 — **Master of Engineering in Civil and Environmental Engineering** — Cambridge, MA
Massachusetts Institute of Technology
Thesis: The phase separation inlet for droplets, ice residuals, and interstitial aerosols
Advisor: Dr. Daniel J. Cziczo

2017 — **Bachelor of Science in Earth, Atmospheric, and Planetary Sciences** — Cambridge, MA
Massachusetts Institute of Technology
Thesis: Characterization of a 3D printed pumped counterflow virtual impactor and an aerodynamic lens concentrator
Minor: Atmospheric Chemistry
Concentration: Music and Theater Arts

PROFESSIONAL HISTORY

2021-2026 — **Graduate Research Assistant**, University of California, Berkeley — Berkeley, CA
Advisor: Joshua Apte

2018-2021 — **Air Quality Consultant & Senior Air Quality Consultant**, Ramboll — San Francisco, CA
Area of expertise: emissions inventory development and health risk analysis

2015-2018 — **Undergraduate & Graduate Research Fellow**, MIT — Cambridge, MA
Advisor: Daniel Cziczo

2014 — **Undergraduate Research Fellow**, MIT — Cambridge, MA
Advisor: Noelle Selin

PUBLICATIONS

Peer-Reviewed

2024 — **Koolik, L. H.**, Alvarado, Á., Budahn, A., Plummer, L., Marshall, J. D., and Apte, J. S.: $PM_{2.5}$ exposure disparities persist despite strict vehicle emissions controls in California, Sci. Adv., 10, eadn8544, https://doi.org/10.1126/sciadv.adn8544, 2024.

2022 — **Koolik, L.**, Roesch, M., Dameto de Espana, C., Rapp, C. N., Franco Deloya, L. J., Shen, C., Hallar, A. G., McCubbin, I. B., and Cziczo, D. J.: A phase separation inlet for droplets, ice residuals, and interstitial aerosol particles, Atmos. Meas. Tech., 15, 3213–3222, https://doi.org/10.5194/amt-15-3213-2022, 2022.

Submitted for Review

In review **Koolik, L. H.**, Bullard, R. D., Min, E., Morello-Frosch, R., Salgado, M., Patterson, R., Wedekind, N., Marshall, J. D., and Apte, J. S.: Eliminating systemic disparities in air pollution exposure requires more than emission reduction, *submitted for review*.

In review **Koolik, L. H.**, Speizer, S., Rong, C., Chambliss, S., Marshall, J. D., Morello-Frosch, R., Tessum, C., and Apte, J. S.: Methodological Design Choices Can Affect Air Pollution Exposure Disparity Estimates: A Case Study on California's Agricultural Sector, *submitted for review*.

In review Marshall, J. D., **Koolik, L. H.**, Ünal, A., Morello-Frosch, R., and Apte, J. S.: Advancing Methods and Models that Promote Equity in Air Quality, *submitted for review*.

In Preparation (submission within 2 months)

In prep. Manchanda, C. & **Koolik, L. H.** (co-first), Ünal, A., Fung, I., Marshall, J. D., Morello-Frosch, R., Turner, A. J., Harley, R. A., and Apte, J. S.: Reverse-Engineering Optimal Pathways to a Triple Win in Air Quality, Climate, and Equity, *in prep*.

In prep. Wang, Y., Barrientos, C. L., Jin, L., **Koolik, L. H.,** Marshall, J. D., Rojas Mendoza, L., Ünal, A., Venkataraman, C., and Apte, J. S.: Advancing State-Level Air Quality Management with New Source-Receptor Tools, *in prep*.

AWARDS AND FELLOWSHIPS

2025
- Philomathia Graduate Student Fellowships in the Environmental Sciences
- Joan Daisey Air Quality Research Award
- Lau Graduate Fellowship in Climate Equity

2024
- American Geophysical Union Outstanding Student Presentation Award

2023
- Hearts to Humanity Eternal (H2H8) Graduate Research Fellowship
- Health Effects Institute Jane Warren Award

2021
- University of California, Berkeley Chancellor Fellowship

2019
- Ramboll Extraordinary Individual Contribution to the Business Unit Award

2016
- MIT Department of Earth, Atmospheric, and Planetary Science Achievement Award

---

MENTORSHIP AND ADVISING

Graduate Student Research Collaboration

- Simone Speizer (2024-present): "Methodological Design Choices Can Affect Air Pollution Exposure Disparity Estimates: A Case Study on California's Agricultural Sector." ***Manuscript currently undergoing peer review.***

- Cassidy Barrientos (2024-present): "Historical Trends in Exposure Equity Associated with California's Cap and Trade Program." ***Work currently in preparation for submission to a peer-reviewed journal.***

- Lucas Rojas Mendoza (2023-present): "Analyzing Sources and Scales of Air Pollution Disparities in the US and California: Examining Urban-Rural Emission Interactions in disadvantaged communities." Poster presented at the American Geophysical Union Fall Meeting 2023, San Francisco, CA. December 11-15, 2023. ***Work currently in preparation for submission to a peer-reviewed journal.***

Undergraduate Student Research Mentorship

- Meghana Raj (2024-present): "Comparing Methodologies for Air Pollution Health Impact Assessments in Open-Source Modeling for Equity in California." Direct contributions to the modeling pipeline currently in use by California state agencies.

- Benjamin Salop (2024-2025): "Future-Proofing Open-Source, Accessible Air Pollution Modeling Pipelines for Increased Usability." Direct contributions to the modeling pipeline currently in use by California state agencies.

- Amy Yao (2024): "Developing Automated Techniques for Processing Complex Population Data." Direct contributions to the modeling pipeline currently in use by California state agencies.

- Clara Rong (2023-2024): "Decomposing California's Agricultural Sector for Insights Towards Equitable Air Quality." Poster presented at the American Geophysical Union Fall Meeting 2023, San Francisco, CA. December 11-15, 2023. ***Manuscript currently undergoing peer review.***

- Thomas Le (2022-2023): "Increasing Accessibility for Modeling Point Source Emissions." Emissions processing pipeline developed is currently in use by state agencies.

Other Mentorship

- MIT Terrascope Alumni Mentor (2022-present): provide support and guidance for undergraduate program that challenges freshmen to develop engineering solutions to global environmental problems.

- Berkeley Graduate Women in Engineering x Society of Women Engineering Mentor (2022-present): provide research and career advice to undergraduate women and non-binary engineers.

Advisory Roles

- UCLA Environmental Science Senior Practicum (2024 & 2025): provide introductory training resources and ongoing support for air pollution modeling efforts by undergraduate student research teams advised by Professor Pablo Saide.

- Community Health and Environmental Impacts Section of the California Office of Environmental Health Hazard Assessment (2022-present): provide ongoing technical support and code development for open-access model developed.

INVITED PRESENTATIONS

2024

- Featured presenter and panelist at American Geophysical Union GeoHealth Oustanding Student Presentation Award-Winning Research: Exploring Equity and Emission Impacts in GeoHealth. Virtual. July 19, 2024.

- Oral presentation at the 2024 Joint American Geophysical Union/American Meteorological Society Showcase. Virtual. April 3, 2024.

2023

- EJ-AIR Workshop: Using Air Pollution Data and Models for Environmental Justice, Berkeley, CA. December 7-9, 2023.

- Featured talk in the Jane Warren Award Plenary at the Health Effects Institute Annual Conference, Boston, MA. April 28 - May 3, 2023.

- PAVITRA Project Launch and Capacity Building Workshop, Bengaluru, India. March 2-6, 2023.

CONFERENCE PRESENTATIONS

2025
- Poster presentation at the Health Effects Institute Annual Conference, Austin, TX. May 4-6, 2025.

2024
- Poster presentation at American Geophysical Union Fall Meeting, Washington D.C. December 9-13, 2024.
- Oral presentation at International Society for Environmental Epidemiology Annual Conference, Santiago, Chile. August 25-28, 2024.
- Poster presentation at Health Effects Institute Annual Conference, Philadelphia, PA. April 28-30, 2024.

2023
- Oral presentation at American Geophysical Union Fall Meeting, San Francisco, CA. December 11-15, 2024. ***Winner of the 2023 Outstanding Student Presentation Award.***
- Poster presentation at the Health Effects Institute Annual Conference, Boston, MA. April 28 - May 3, 2023. ***Winner of the 2023 Jane Warren Award.***

TEACHING EXPERIENCE

2025
- Discipline Cluster Leader for UC Berkeley Fall Teaching Conference for First-Time Student Instructors

2022
- Graduate Student Instructor for Berkeley School of Public Health graduate-level course on Exposure Assessments and Controls.

2017, 2018
- Teaching Assistant for MIT's Discover Earth, Atmospheric, and Planetary Sciences Extreme Weather Freshman Program.

2015
- 7th grade chemistry instructor for MIT's Office of Engineering Outreach Program's middle school STEM program.

2015
- Volunteer and guest teacher as part of MIT and Teach for America's Four Weeks for America teaching program.

2014
- Undergraduate Teaching Fellow for the Solving Complex Problems course through MIT's "Mission 2018" cohort of the Terrascope program.

SERVICE AND OUTREACH

Academic Service

- American Geophysical Union GeoHealth Early Career Committee
- Peer Review for *Environmental Science & Technology* and *GeoHealth*
- 2023 Environmental Engineering Seminar Committee

Relevant Volunteering

- Lead coordinator for series of wildfire smoke air filtration workshops for La Clinica de la Raza, Community Resources for Science, and Stockton Unified School District (2023-present).

Open-Source Software and Resource Development

- **E**stimating **C**oncentrations and **H**ealth **O**utcomes: **A**utomated **I**SRM **R**esource (ECHO-AIR): Lead engineer of a fully open-source model designed to increase accessibility in high-resolution air pollution modeling.
  See more at: https://echo-air-model.github.io/
- Collection of research graphics and slide templates available on my personal website: https://lkoolik.github.io/