

# Lyssa Freese

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[lfreese.github.io](https://lfreese.github.io)

## Education

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**Ph.D. — Massachusetts Institute of Technology Department of Earth, Atmospheric, and Planetary Sciences.** Atmospheric Science. May, 2023.

- Title: Energy Policy Impacts on Air Quality, Climate Change, and Equity at the National and Global Scale
- Advisor: Noelle Selin

**B.S. — Georgetown University Edmund A. Walsh School of Foreign Service.**

Science, Technology, and International Affairs: Health and the Environment. May, 2016.

## Research and Work Experience

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**Carnegie Institution for Science at Stanford.** Stanford, CA.

Department of Global Ecology Postdoctoral Fellow. Advised by Ken Caldeira. *August, 2023-Present.*

**MIT Department of Earth, Atmospheric, and Planetary Sciences.** Cambridge, MA.

Research Assistant. *Fall 2018-Summer 2023.*

**China Environment Forum at the Wilson Center.** Washington, D.C.

Research Assistant. *Fall 2017- Fall 2018.*

**Rock Environment and Energy Institute.** Beijing, China.

Research Assistant. *Fall 2016- Summer 2017.*

## Academic Publications

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### In Prep

**Freese, L. M.,** Eastham, S., Han Springer, C., Selin, N. Ensembles of Early Coal Retirement Trajectories In Southeast Asia— Air Quality, Health, and Climate Impacts through a Reduced Form Black Carbon Model, *in prep for Environmental Research Letters* (manuscript available upon request).

### Submitted and In Review

**Freese, L. M.,** Davis, S., Virgüez, E., Caldeira, K. Country-to-Country Imposition of Climate Damages, *submitted to Nature* (manuscript available upon request).

**Freese, L. M.,** Fiore, A.M., Selin, N. E. Spatially Resolved Temperature Response Functions to CO<sub>2</sub> Emissions, *in revision for Geophysical Research Letters* (preprint:

[10.22541/essoar.168986213.37265300/v1](https://doi.org/10.22541/essoar.168986213.37265300/v1), revised manuscript available upon request).

Duffy, M., Barnes, L., **Freese, L.M.,** Freilich, M., Lalk, E., Ranganathan, M. Shivamoggi, R., Wilcots, J., Wirz, C. An empirical analysis of how geoscientists from marginalized groups decide to accept or decline a faculty job offer, *submitted to Earth's Future* (preprint: [10.22541/essoar.170612426.63684810/v1](https://doi.org/10.22541/essoar.170612426.63684810/v1)).

### Published

**Freese, L. M.,** Chossiere, G., Eastham, S., Jenn, A., Selin, N. Eliminating Nuclear and Coal Power Generation Redistributes U.S. Air Quality and Climate Related Mortality Risk, 2023, *Nature Energy*.

<https://doi.org/10.1038/s41560-023-01241-8> (openly available read-only version <https://rdcu.be/c9yPn>).

Garima Raheja, Leatra Harper, Ana Hoffman, Yuri Gorby, **Freese, L. M.**, Brendan O’Leary, Melissa Goodwin, Daniel M. Westervelt. Community-Based Participatory Research for Low-Cost Air Pollution Monitoring in the Wake of Unconventional Oil and Gas Development in the Ohio River Valley – Empowering Impacted Residents through Community Science, 2022, *Environmental Research Letters*. <https://doi.org/10.1088/1748-9326/ac6ad6>.

**Freese, L. M.**, Cronin, T.W. Antarctic Radiative and Temperature Responses to a Doubling of CO<sub>2</sub>, 2021, *Geophysical Research Letters*. <https://doi.org/10.1029/2021GL093676>.

Ranganathan, M., Lalk, E., **Freese, L. M.**, Freilich, M.A., Wilcots, J., Duffy, M.L., Shivamoggi, R., Trends in the representation of women amongst geoscience faculty from 1999-2020: the long road towards gender parity, 2021, *AGU Advances*. <https://doi.org/10.1029/2021AV000436>.

### Reports, White Papers, and News Articles

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Virguéz, E., Leon Gasca, L., **Freese, L.**, [The Climate Sciences Need Representation from the Global South](#). 2023, One Earth.

Freilich, M., Wilka, C., Shivamoggi, R., **Freese, L.**, Heiderich, J., Drake, H. F., Cantine, M. 2019. [“Young Climate Scientists Speak Out”](#). Special Climate Crisis Issue of DigBoston.

Goodman, S and **Freese, L.** 2018. [“China’s Ready to Cash in on a Melting Arctic”](#). Foreign Policy.

**Freese, L.** 2018. [“Why Citizen Science Faces an Uphill Climb in China”](#). Sixth Tone.

**Freese, L.** 2018. [“How Citizen Science is Helping Save China’s Environment”](#). Sixth Tone.

JiaQiao, Lin and **Freese, L.** 2017. “China’s Coal-based Thermal Power Sector: Compliance of Environmental Standards”. Written for consultation with Centre for Science and Environment, India.

**Freese, L.** 2017. “The ‘Just Transition’ is not just a simple transition: the complexities of China’s coal phase-out”. Published in Rock Environment and Energy Institute’s Annual Energy Review 2016 and on their website.

**Freese, L.** 2016. “Polluting the Internet: ENGO Social Media Strategy and Capacity in China”. Senior Honors Thesis at Georgetown University. Advised by Joanna Lewis.

### Grants, Fellowships, and Honors

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Peter B. Wagner Memorial Award for Women in Atmospheric Sciences. Second Place for paper, Antarctic Radiative and Temperature Responses to a Doubling of CO<sub>2</sub>. 2022.

[Martin Fellowship for Sustainability](#). PhD Fellowship. 2022-2023.

**Department of State Air Quality Fellow**. Beijing Office. 2021-2022.

**Jack C. Tang (1949) Fellowship**. PhD Fellowship. 2020.

**NIEHS Training Grant in Environmental Toxicology**. PhD Training Grant. 2019-2023.

**AMS Summer Policy Colloquium NSF Fellowship**. Summer Policy Colloquium run by AMS and funded by NSF. Summer 2019.

**MIT Presidential Fellowship**. Year-long PhD Student Fellowship. 2018-2019.

**Sixth Tone Environmental Research Fellowship.** Summer Fellowship.  
“Environmental Protection in the Countryside”. 2018.

**Georgetown University Environment Initiative.** Summer Fellowship.  
“Polluting the Internet: ENGO Social Media Strategy and Capacity in China”. 2015.

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## Teaching

**Seminar on Racism, Colonialism, and Extraction in Geosciences.** Co-creator and Instructor. *Spring 2021 and 2022.*

**Kaufman Teaching Certificate Program.** *Spring, 2022.*

**People and the Planet: Environmental Governance and Science.** Teaching Assistant. *Fall 2021.*

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## Mentorship

**Undergraduate Research Advisor:** Gabby Cazerres, *Fall 2019-Spring 2020*; Yuka Perera, *Summer 2020.*

**Graduate Residential Advisor:** Mentor for 90 undergraduate students.

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## Conference Presentations and Invited Talks

Colorado University, Boulder. Environmental Sciences. *Upcoming*, Spring, 2024.

Carnegie Mellon University. Civil and Environmental Engineering. Spring, 2024.

University of Texas, Austin. Water Climate and Energy Seminar. Fall, 2022.

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## Conference Presentations

**Freese, L.M.** Innovation Session: Use of Earth Observations to Advance the Role of Equity and Environmental Justice in Open Science. AGU. *Invited Talk.* 2023.

**Freese, L.M.,** Fiore, A.M., Selin, N. Emulating Spatial Patterns of Surface Temperature Responses to CO<sub>2</sub> Emissions. AGU. *Poster.* 2023.

**Freese, L. M.,** Eastham, S., Han Springer, C., Selin, N. Ensembles of Early Coal Retirement Trajectories In Southeast Asia— Air Quality, Health, and Climate Impacts through a Reduced Form Black Carbon Model. International Global Atmospheric Chemistry Conference (IGAC). *Poster.* 2022.

**Freese, L.,** Cronin, T. Antarctic Radiative and Temperature Responses to a Doubling of CO<sub>2</sub>. Princeton Center for Theoretical Science: From Spectroscopy to Climate. *Talk.* 2022.

**Freese, L.,** Chossiere, G., Eastham, S., Jenn, A., Selin, N.E. Nuclear and Coal Power Generation Phaseouts Redistribute U.S. Air Quality and Climate Related Mortality Risk. Macro Energy Systems Workshop. *Lightning Talk.* 2022.

**Freese, L.,** Eastham, S., Han Springer, C., Selin, N.E. Black Carbon Climate and Health Impacts of Coal Power Plant Lifetimes, Locations and Funders through the creation of a Reduced Form Model. International GEOS-Chem Conference (IGC10). *Talk.* 2022.

**Freese, L.,** Eastham, S., Han Springer, C., Selin, N.E. Black Carbon Climate and Health Impacts of Coal Power Plant Lifetimes, Locations and Funders through the creation of a Reduced Form Model. American Geophysical Union (AGU) Annual Conference. *Poster.* 2021.

**Freese, L.,** Chossiere, G., Eastham, S., Jenn, A., Selin, N.E. Nuclear and Coal Power Generation Phaseouts Redistribute U.S. Air Quality and Climate Related Mortality Risk. American Geophysical Union (AGU) Annual Conference. *Lightning Talk.* 2020.

## Academic Service

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**Peer Reviewer.** Nature, Environmental Research Letters, GeoHealth, Geophysical Research Letters.

**AGU Session Chair and Organizer.** Environmental Justice/Equity and Global Change. 2021.

Net Zero Emissions Energy Systems: Geophysical Constraints, Consequences, and Opportunities. 2023.

**Program in Atmospheres, Oceans and Climate (PAOC) Colloquium Series.** Planning Committee Member. 2019-2023.

**MIT Atmospheric Chemistry Colloquium.** Co-founder and organizer. 2019-2021.

**Graduate Climate Conference.** Executive Co-Chair. 2020.

**Taskforce 2023.** MIT EAPS Department task force focused on the Department's Organization, Cohesion, Experience, and Diversity. 2019-2020.

## Justice, Equity, Diversity, and Inclusion

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**AGU Thriving Earth Exchange.** Community Scientist. *Current.*

**Carnegie Department of Global Ecology DEI Group.** Member. *Current.*

**Towards Inclusion, Diversity, and Equity Student Group.** President. 2022-2023.

**EAPS Application Mentorship Program.** Co-Chair. 2020-2022.

**MIT EAPS Diversity, Equity, and Inclusion Committee.** Graduate Student Representative. 2020-2021.