Tianjia Liu

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PROFESSIONAL APPOINTMENTS

Assistant Professor 2025-
Department of Geography, *The University of British Columbia*
Faculty Associate, Institute for Resources, Environment, and Sustainability (IRES)

NOAA Climate & Global Change Postdoctoral Fellow 2022-2024
Department of Earth System Science, *University of California, Irvine*
Host: James Randerson

NSF Graduate Research Fellow 2017-2022
Department of Earth and Planetary Sciences, *Harvard University*
Advisors: Loretta Mickley and Daniel Jacob

EDUCATION

Harvard University, Cambridge, MA
Ph.D., Earth and Planetary Sciences May 2022
S.M., Environmental Science and Engineering November 2020
Thesis: Modeling the Impact of Human-Driven Fires on Air Quality from Regional and Global Perspectives

Columbia University, New York, NY
B.A., Environmental Science, *magna cum laude* and *departmental honors* May 2017

RESEARCH INTERESTS

I am an interdisciplinary environmental scientist who uses a combination of remote sensing, GIS, data science, and atmospheric modeling to understand modern human-fire relationships, the role of fire in the Earth system, and the impacts of extreme events on planetary health. My research lies at the intersection of atmospheric science, geography, and public health, with special focus on India, Equatorial Asia, and North America.

HONORS, AWARDS, AND FELLOWSHIPS

NOAA Climate and Global Change (C&GC) Postdoctoral Fellowship 2022–2024
ACCESS XVII (Atmospheric Chemistry Colloquium for Emerging Senior Scientists) Participant 2023
Graduate Student Associate, Mittal Institute, Harvard University 2021–2022
Civil and Environmental Engineering Rising Stars, MIT 2021
Bok Center Certificate of Distinction in Teaching, Harvard University 2019, 2021
NSF Graduate Research Fellowship (GRFP) 2017–2022
Phi Beta Kappa, Columbia University 2017
Departmental Honors (Earth and Environmental Sciences), Columbia University 2017
AGU Outstanding Student Paper Award, Ocean Sciences 2017
Young Investigator Award (Earth and Environmental Sciences), Columbia University 2016
Summer Student Fellowship, Woods Hole Oceanographic Institution 2016

PEER-REVIEWED PUBLICATIONS

h-index: 18, citations: 2321 (as of February 2026), Google Scholar); as first author (11), as co-author (26)
(Note: advisees are underlined, *co-first authors, ˆcorresponding author on student-led papers)

First-author and student-led papers

[28] Chung, K., **T. Liu**^, M. Kelp, K. Vohra, D. Skelly, M.C. Carroll, J. Schwartz, and L.J. Mickley (2025). Managing smoke risk from wildland fires: Northern California as a case study. *Environ. Sci. Technol.*, **59**(27), 13912-13923.
https://doi.org/10.1021/acs.est.5c01914

[26] **Liu, T.**, F.M. Panday, M.C. Caine, M. Kelp, D.C. Pendergrass, L.J. Mickley, E.A. Ellicott, M.E. Marlier, R. Ahmadov, and E.P. James (2024). Is the smoke aloft? Caveats regarding the use of the Hazard Mapping System (HMS) smoke product as a proxy for surface smoke presence across the United States. *Int. J. Wildland Fire*, **33**, WF23148.
https://doi.org/10.1071/WF23148

[24] **Liu, T.**, J.T. Randerson, Y. Chen, D.C. Morton, E.B. Wiggins, P. Smyth, E. Foufoula-Georgiou, R. Nadler, and O. Nevo (2024). Systematically tracking the hourly progression of large wildfires using GOES satellite observations. *Earth Sys. Sci. Data*, **16**(3), 1395-1424.
https://doi.org/10.5194/essd-16-1395-2024
Dataset: https://doi.org/10.5281/zenodo.8327264

[16] **Liu, T.**, L.J. Mickley, P.N. Patel, R. Gautam, M. Jain, S. Singh, Balwinder-Singh, R.S. DeFries, and M.E. Marlier (2022). Cascading delays in the monsoon rice growing season and post-monsoon agricultural fires likely exacerbate air pollution in north India. *J. Geophys. Res. Atmos.*, **127**(24), e2022JD036790.
https://doi.org/10.1029/2022JD036790

[12] **Liu, T.**, L.J. Mickley, and J.L. McCarty (2021). Global search for temporal shifts in fire activity: potential human influence on southwest Russia and north Australia fire seasons. *Environ. Res. Lett.*, **16**(4), 044023.
https://doi.org/10.1088/1748-9326/abe328

[11] **Liu, T.** and M.A. Crowley (2021). Detection and impacts of tiling artifacts in MODIS burned area classification. *IOP SciNotes*, **2**(1), 014003.
https://doi.org/10.1088/2633-1357/abd8e2

[9] **Liu, T.**, L.J. Mickley, R. Gautam, M.K. Singh, R.S. DeFries, and M.E. Marlier (2021). Detection of delay in post-monsoon agricultural burning across Punjab, India: potential drivers and consequences for air quality. *Environ. Res. Lett.*, **16**(1), 014014.
https://doi.org/10.1088/1748-9326/abcc28

[8] **Liu, T.**, L.J. Mickley, S. Singh, M. Jain, R.S. DeFries, and M.E. Marlier (2020). Crop residue burning practices across north India inferred from household survey data: bridging gaps in satellite observations. *Atmos. Environ. X*, **8**, 100091.
https://doi.org/10.1016/j.aeaoa.2020.100091
Dataset: https://doi.org/10.7910/DVN/JUMXOL

[7] **Liu, T.**, L.J. Mickley, M.E. Marlier, R.S. DeFries, M.F. Khan, M.T. Latif, and A. Karambelas (2020). Diagnosing spatial biases and uncertainties in global fire emissions inventories: Indonesia as regional case study. *Remote Sens. Environ.*, **237**, 111557.
https://doi.org/10.1016/j.rse.2019.111557
• Special issue on "Remote Sensing of Land Change Science with Google Earth Engine"

[5] **Liu, T.**, M.E. Marlier, A. Karambelas, M. Jain, S. Singh, M.K. Singh, R. Gautam, and R.S. DeFries (2019). Missing emissions from post-monsoon agricultural fires in northwestern India: regional limitations of MODIS burned area and active fire products. *Environ. Res. Commun.*, **1**(1), 011007.
https://doi.org/10.1088/2515-7620/ab056c
• Highlighted by Ladies of Landsat #ManuscriptMonday on December 23, 2019

[4] **Liu, T.**, R.W. Schmitt, and L. Li (2018). Global search for autumn-lead sea surface salinity predictors of winter precipitation in southwestern United States. *Geophys. Res. Lett.*, **45**(16), 8445-8454.
https://doi.org/10.1029/2018GL079293

[2] **Liu, T.**, M.E. Marlier, R.S. DeFries, D.M. Westervelt, K.R. Xia, A.M. Fiore, L.J. Mickley, D.H. Cusworth, and G. Milly (2018). Seasonal impact of regional outdoor biomass burning on air pollution in three Indian cities: Delhi, Bengaluru, and Pune. *Atmos. Environ.*, **173**, 83-92.
https://doi.org/10.1016/j.atmosenv.2017.10.024

Co-authored papers

[37] Ouattara, B., N. Touré, J. Danumah, **T. Liu**, and F. Mouillot (2026). When less burning does not mean cleaner air: decoupling of burned area, $PM_{2.5}$ emissions and exposure in West Africa. *Environ. Chall.*, **22**, 101424.
https://doi.org/10.1016/j.envc.2026.101424

[36] Scholten, R.C., T. Banerjee, Y. Chen, A. Delgado, A. Desai, Z. Ke, **T. Liu**, D.C. Morton, D.A. Peterson, Q. Tang, S. Veraverbeke, J. Zhang, and J.T. Randerson (2026). Multi-ignition fire complexes drive extreme fire years and impacts. *Sci. Adv.*, **12**, eadx6477.
https://doi.org/10.1126/sciadv.adx6477

[35] Coffield, S.R., T.D. McCabe, W. Schroeder, Y. Chen, E. Orland, **T. Liu**, E.B. Wiggins, J.T. Randerson, M.B. Follette-Cook, and D.C. Morton (2026). Leveraging additional VIIRS information to improve fire tracking and emissions estimation in the western US. *Remote Sens. Environ.*, **334**, 115156.
https://doi.org/10.1016/j.rse.2025.115156

[34] Feng, X., L.J. Mickley, J.O. Kaplan, M. Kelp, Y. Li, and **T. Liu** (2025). Large role of anthropogenic climate change in driving smoke concentrations across the western United States from 1992 to 2020. *Proc. Natl. Acad. Sci. U.S.A.*, **122**(49), e2421903122.
https://doi.org/10.1073/pnas.2421903122

[33] Orland, E., T.D. McCabe, Y. Chen, R.C. Scholten, Z. Becker, R. Loehman, J.T. Randerson, S.R. Coffield, **T. Liu**, A.N. Shiklomanov, K. Nelson, B. Peterson, M.B. Follette-Cook, and D.C. Morton (2025). Near real-time indicators of burn severity in the western U.S. from active fire tracking. *Fire Ecol.*, **21**, 55.
https://doi.org/10.1186/s42408-025-00407-x

[32] VoPham, T., **T. Liu**, M. Cortez, S. Karasaki, N.F. Falkenberg, H.Y. Zewdie, J. Lin, C. Nondin, S.L.S. Chao, T. Knowlton, B. Quennehen, J.A. Mendoza, G.N. Ioannou, K. Berry, G. Adamkiewicz, C.I. Li, and J.E. Hart (2025). Exposure to outdoor air pollution, wildfires, and cancer survival in the United States. *Cancer Epidemiol.*, **98**, 102899.
https://doi.org/10.1016/j.canep.2025.102899

[31] Schollaert, C., R. Connolly, L. Cushing, M. Jerrett, **T. Liu**, and M.E. Marlier (2025). Air quality impacts of the 2025 Los Angeles wildfires: Insights from public data sources. *Environ. Sci. Technol. Lett.*, **2**(8), 911-917.
https://doi.org/10.1021/acs.estlett.5c00486

[30] Parrington, M. and 22 others, including **T. Liu** (2025). Biomass burning emission estimation in the MODIS era: state-of-the-art and future directions. *Elem. Sci. Anth.*, **13**(1), 00089.
https://doi.org/10.1525/elementa.2024.00089

[29] Kelp, M., M. Burke, M. Qiu, I. Higuera-Mendieta, **T. Liu**, and N. Diffenbaugh (2025). Effect of recent prescribed burning and land management on wildfire burn severity and smoke emissions in the western United States. *AGU Adv.*, **6**, e2025AV001682.
https://doi.org/10.1029/2025AV001682

[27] Whaley, C.H. and 34 others, including **T. Liu**. HTAP3 Fires: Towards a multi-model, multi-pollutant study of fire impacts (2025). *Geosci. Model. Dev.*, **18**, 3265-3309.
https://doi.org/10.5194/gmd-18-3265-2025

[25] Madrigano, J., D. Yan, **T. Liu**, E. Bonilla, N. Yulianti, L.J. Mickley, and M.E. Marlier (2024). Air pollution and blood pressure: Evidence from Indonesia. *GeoHealth*, **8**(7), e2024GH001014.
https://doi.org/10.1029/2024GH001014

[23] Feng, X., L.J. Mickley, M.L. Bell, **T. Liu**, J.A. Fisher, and M. Val Martin (2024). Improved estimates of smoke exposure during Australia fire seasons: Importance of quantifying plume injection heights. *Atmos. Chem. Phys.*, **24**(5), 2985-3007.
https://doi.org/10.5194/acp-24-2985-2024

[22] Kelp, M., T. Fargiano, S. Lin, **T. Liu**, J.R. Turner, J.N. Kutz, and L.J. Mickley (2023). Data-driven placement of $PM_{2.5}$ air quality sensors in the United States: an approach to target urban environmental injustice *GeoHealth*, **7**(9), e2023GH000834.
https://doi.org/10.1029/2023GH000834
• Special issue on "Geospatial data applications for environmental justice"

[21] Singh, A., S.S. Raj, U. Panda, S.M. Kommula, C. Jose, **T. Liu**, S. Huang, B. Swain, M.L. Pöhlker, E. Reyes-Villegas, N. Ojha, A. Vaishya, A. Bigi, R. Ravikrishna, Q. Zhu, L. Shi, J. Allen, S.T. Martin, G. McFiggans, M.O. Andreae, U. Pöschl, H. Coe, F. Bianchi, H. Su, V. P. Kanawade, P. Liu, and S.S. Gunthe (2023). Rapid growth and high cloud-forming potential of anthropogenic sulfate aerosol in a thermal power plant plume during COVID lockdown in India. *NPJ Clim. Atmos. Sci.*, **6**, 109.
https://doi.org/10.1038/s41612-023-00430-2

[20] Gautam, R., P.N. Patel, M.K. Singh, **T. Liu**, L.J. Mickley, H. Jethva, and R.S. DeFries (2023). Extreme smog challenge of northern India intensified by increasing lower tropospheric stability. *Geophys. Res. Lett.*, **50**(11), e2023GL103105.
https://doi.org/10.1029/2023GL103105

[19] Dang, R., D.J. Jacob, V. Shah, S.D. Eastham, T.M. Fritz, L.J. Mickley, **T. Liu**, Y. Wang, and J. Wang (2023). Background nitrogen dioxide (NO_2) over the United States and its implications for satellite observations and trends: effects of nitrate photolysis, aircraft, and open fires. *Atmos. Chem. Phys.*, **23**(11), 6271-6284.
https://doi.org/10.5194/acp-23-6271-2023

[18] Kelp, M., M. Carroll, **T. Liu**, R.M. Yantosca, H.E. Hockenberry, and L.J. Mickley (2023). Prescribed burns as a tool to mitigate future wildfire smoke exposures: Lessons for states and environmental justice communities. *Earth's Future*, **11**(6), e2022EF003468.
https://doi.org/10.1029/2022EF003468

[17] Crowley, M.A., C.A. Stockdale, J.M. Johnston, M.A. Wulder, **T. Liu**, J.L. McCarty, J.T. Rieb, J.A. Cardille, and J.C. White (2023). Towards a whole-system framework for wildfire monitoring using Earth observations. *Glob. Chang. Biol.*, **29**(6), 1423-1436.
https://doi.org/10.1111/gcb.16567

[15] Lan, R., S.D. Eastham, **T. Liu**, L.K. Norford, and S.R.H. Barrett. Air quality impacts of crop residue burning in India and mitigation alternatives (2022). *Nat. Commun.*, **13**, 6537.
https://doi.org/10.1038/s41467-022-34093-z

[14] Kommula, S., U. Panda, A. Sharma, S.S. Raj, E. Reyes Villegas, **T. Liu**, J. Allan, C. Jose, M.L. Pöhlker, R. Raghunathan, P. Liu, H. Su, S. Martin, U. Pöschl, G. McFiggans, H. Coe, and S.S. Gunthe (2021). Chemical characterization and source apportionment of organic aerosols in the coastal city of Chennai, India: Impact of marine air masses on aerosol chemical composition and potential for SOA formation. *ACS Earth Space Chem.*, **5**(11), 3197-3209.
https://doi.org/10.1021/acsearthspacechem.1c00276

[13] Zhou, X., K. Josey, L. Kamareddine, M.C. Caine, **T. Liu**, L.J. Mickley, M. Cooper, and F. Dominici (2021). Excess of COVID-19 cases and deaths due to fine particulate matter exposure during the 2020 wildfires in the United States. *Sci. Adv.*, **7**(33), eabi8789.
https://doi.org/10.1126/sciadv.abi8789

[10] Gunthe, S.S., P. Liu, U. Panda, S.S. Raj, A. Sharma, E. Derbyshire, E. Reyes-Villegas, J. Allan, Y. Chen, X. Wang, S. Song, M.L. Pöhlker, L. Shi, Y. Wang, S.M. Kommula, **T. Liu**, R. Ravikrishna, G. McFiggans, L.J. Mickley, S.T. Martin, U. Pöschl, M.O. Andreae, and H. Coe (2021). Enhanced aerosol particle growth sustained by high continental chlorine emission in India. *Nat. Geosci.*, **14**, 77–84.
https://doi.org/10.1038/s41561-020-00677-x

[6] Marlier, M.E., **T. Liu**, K. Yu, J.J. Buonocore, S.N. Koplitz, R.S. DeFries, L.J. Mickley, D.J. Jacob, J. Schwartz, B.S. Wardhana, and S.S. Myers (2019). Fires, smoke exposure, and public health: an integrative framework to maximize health benefits from peatland restoration. *GeoHealth*, **3**(7), 178-189. https://doi.org/10.1029/2019GH000191

[3] Cusworth, D.H., L.J. Mickley, M.P. Sulprizio, **T. Liu**, M.E. Marlier, R.S. DeFries, S.K. Guttikunda, and P. Gupta (2018). Quantifying the influence of agricultural fires in northwest India on urban air pollution in Delhi, India. *Environ. Res. Lett.*, **13**(4), 044018. https://doi.org/10.1088/1748-9326/aab303

[1] Koplitz, S.N., L.J. Mickley, M.E. Marlier, J.J. Buonocore, P.S. Kim, **T. Liu**, M.P. Sulprizio, R.S. DeFries, D.J. Jacob, J. Schwartz, and S.S. Myers (2016). Public health impacts of the severe haze in Equatorial Asia in September–October 2015: demonstration of a new framework for informing fire management strategies to reduce downwind smoke exposure. *Environ. Res. Lett.*, **11**(9), 094023. https://doi.org/10.1088/1748-9326/11/9/094023
• Editors' Highlights of 2016 in *Environmental Research Letters*

In Review

[38] Wiggins, E.B., Y. Chen, S.R. Coffield, R. Field, M.B. Follette-Cook, E.M. Gargulinski, **T. Liu**, T.D. McCabe, D.C. Morton, E. Orland, L. Ott, J.T. Randerson, C. Schmidt, A.J. Soja, and P. Wales. Variability in the diurnal cycle of fire activity for wildfires in the western United States. (*in review* at *JGR: Atmos.*)

[39] Bhattarai, H., **T. Liu**, A. Ismaeel, and A.P. Tai. Air quality impacts of post-monsoon crop residue burning in Northern India based on regional and global emission inventories. (*in review* at *Atmos. Environ.*)

[40] Xie, Y., D.L. Mauzerall, M. Lin, J. Angoy, B. Ford, J. McGinnis, J.R. Pierce, L.W. Horowitz, **T. Liu**, M. Zhou, B. Lyu, and H. Khan. Improving estimates of wildfire smoke contributions to surface $PM_{2.5}$ pollution in support of US air quality management. (*in review* at *One Earth*)

BOOK CHAPTERS

[1] Crowley, M.A.* and **T. Liu*** (2023). "Active Fire Monitoring." *Cloud-based Remote Sensing with Google Earth Engine: Fundamentals and Applications. Springer*, 1005-1022. https://doi.org/10.1007/978-3-031-26588-4
- Website: https://eefabook.org; video walkthrough (October 23, 2023)

PRESENTATIONS

[Links to abstracts and posters]

Invited Talks and Seminars

[32] University of British Columbia, Climate Dynamics Group, Vancouver, BC, April 29, 2025

[31] University of Colorado, Boulder, Environmental Data Science Seminar Series, Earth Lab, virtual, March 18, 2025

[30] Scripps Institution of Oceanography, Climate and Atmosphere Seminar Series, La Jolla, CA, October 8, 2024

[29] Nanjing University of Information Science and Technology (NUIST), School of Environmental Science and Engineering Seminar, Nanjing, China, September 23, 2024

[28] Southern University of Science and Technology (SUSTech), School of Environment Seminar, Shenzhen, China, September 19, 2024

[27] The Chinese University of Hong Kong (CUHK), Department of Earth and Environmental Sciences Seminar, Hong Kong, September 16, 2024

[26] Webinar Series: Lessons learned on Wildfire Risk Mapping, Integrated Fire Management Systems and Value Chain Assessments from Northern Thailand (and Globally), Spatial Informatics Group (SIG), virtual, September 13, 2024

[25] University of British Columbia, Weather Forecast Research Team (WFRT) Seminar, virtual, July 25, 2024

[24] NOAA Climate & Global Change Summer Institute, Steamboat Springs, CO, July 16, 2024

[23] Mini-symposium on Wildland Fire Modeling, SIAM Conference on Mathematics of Planet Earth (MPE24), Portland, OR, June 11, 2024

[22] MIT, Department of Civil and Environmental Engineering Seminar, Cambridge, MA, April 1, 2024

[21] Duke University, Division of Earth and Climate Sciences Seminar, Nicholas School of the Environment, Durham, NC, March 28, 2024

[20] University of Utah, Department of Atmospheric Sciences Seminar, Salt Lake City, UT, February 27, 2024

[19] "Fire Monitoring in Google Earth Engine," Natural Resources Canada, virtual, January 30, 2024

[18] University of British Columbia, Department of Geography Seminar, Vancouver, BC, January 16, 2024

[17] "Measuring Wildfire-Fuel Treatment Outcomes at Large Scales" Workshop, 10th Annual International Fire Ecology and Management Congress, Monterey, CA, December 4, 2023

[16] EPA Model Applications Weekly Meeting, virtual, November 15, 2023

[15] BBURNED Fire Emissions Workshop, virtual, November 9, 2023

[14] ECHO Lab, Stanford University, Stanford, CA, October 16, 2023

[13] NASA NEX Weekly Technical Tag-Up Meeting, virtual, October 5, 2023

[12] American Geophysical Union Atmospheric Science Early Career Webinar, virtual, August 22, 2023

[11] ACCESS XVII (Seventeenth Atmospheric Chemistry Colloquium for Emerging Senior Scientists), Brookhaven National Laboratory, Upton, NY, July 29, 2023

[10] USFS NOAA Fire Weather Research Memorandum of Understanding (MOU) Working Group Meeting, virtual, July 25, 2023

[9] University of Southern California, Department of Earth Sciences Seminar, Los Angeles, CA, March 27, 2023

[8] Geo for Good Lightning Talk Series #1: Earth Engine Apps, Google, virtual, April 8, 2021

[7] MIT CEE Rising Stars Workshop, Cambridge, MA, October 28, 2021

[6] Indonesian Disaster Relief Agency (BNPB), Jakarta, Indonesia, August 15, 2019

[5] World Resources Institute (WRI), Jakarta, Indonesia, August 14, 2019

[4] World Wildlife Fund (WWF), Jakarta, Indonesia, August 14, 2019

[3] Greenpeace, Jakarta, Indonesia, August 13, 2019

[2] Katadata Forum, Jakarta, Indonesia, August 13, 2019

[1] Union eLightning Talk, American Geophysical Union Fall Meeting, New Orleans, LA, December 12, 2017

Selected Conference Presentations

[15] **Liu, T.**, A. Delgado, Y. Chen, B. Parellada, G. Migliorini, R.C. Scholten, P. Smyth, E. Foufoula-Georgiou, and J.T. Randerson. Building a modeling framework to untangle the influence of suppression on wildfire growth in California. American Geophysical Union Fall Meeting, Washington, D.C., December 9, 2024. (Talk)

[14] **Liu, T.**, J.T. Randerson, Y. Chen, D.C. Morton, E.B. Wiggins, P. Smyth, and E. Foufoula-Georgiou. Active Fire Line as a Key Control on Hourly Fire Growth for Predictive Modeling. American Geophysical Union Fall Meeting, San Francisco, CA, December 13, 2023. (Poster)

[13] **Liu, T.**, J.T. Randerson, Y. Chen, D.C. Morton, E.B. Wiggins, P. Smyth, and E. Foufoula-Georgiou. Developing an Hourly Fire Progression Database for Large California Wildfires: Application for Modeling Fire Spread Rates.

- AMS 14th Fire and Forest Meteorology Symposium, Minneapolis, MN, May 2, 2023. (Talk)
- Gordon Research Conference in Atmospheric Chemistry, Newry, ME, August 2, 2023. (Poster)

[12] **Liu, T.**, L.J. Mickley, P.N. Patel, R. Gautam, M. Jain, S. Singh, Balwinder-Singh, R.S. DeFries, and M.E. Marlier. Cascading delays in the monsoon rice growing season and post-monsoon agricultural fires likely exacerbate air pollution in North India. American Geophysical Union Fall Meeting, Chicago, IL, December 16, 2022. (Talk)

[11] **Liu, T.**, F.M.S. Panday, M.C. Caine, M. Kelp, D.C. Pendergrass, and L.J. Mickley. Assessment of digitized satellite wildfire smoke plumes with airport observations across the contiguous United States and Alaska from 2008-2021. American Geophysical Union Fall Meeting, Chicago, IL, December 15, 2022. (Poster)

[10] **Liu, T.**, F.M.S. Panday, M.C. Caine, M. Kelp, D.C. Pendergrass, and L.J. Mickley. Smoke in the western United States: a comparison between satellite and airport observations. 10th International GEOS-Chem Meeting (IGC10), St. Louis, MO, June 7, 2022. (Poster)

[9] **Liu, T.**, L.J. Mickley, and J.L. McCarty. Human-driven temporal shifts in fire activity: southwest Russia and north Australia as case study regions. American Geophysical Union Fall Meeting, December 8, 2020. (Talk)

[8] **Liu, T.**, L.J. Mickley, S. Singh, M. Jain, R.S. DeFries, and M.E. Marlier. Revised estimates of agricultural fire emissions for Punjab, India: bridging gaps in satellite observations using household survey data. American Geophysical Union Fall Meeting, San Francisco, CA, December 10, 2019. (Poster)

[7] **Liu, T.**, L.J. Mickley, M.E. Marlier, R.S. DeFries, M.F. Khan, M.T. Latif, and A. Karambelas. Diagnosing spatial biases and uncertainties in global fire emissions inventories: Indonesia as regional case study. 9th International GEOS-Chem Meeting (IGC9), Cambridge, MA, May 6, 2019. (Poster)

[6] **Liu, T.**, M. Lin, L.J. Mickley, P.J. Huybers, R. Gautam, M.K. Singh, R.S. DeFries, and M.E. Marlier. Consequences for regional air quality from temporal shifts in post-monsoon agricultural burning associated with the double-crop cycle of Punjab, India. American Geophysical Union Fall Meeting, Washington D.C., December 12, 2018. (Talk)

[5] **Liu, T.**, M.E. Marlier, A.N Karambelas, M. Jain, and R.S. DeFries. A multi-sensor burned area algorithm for crop residue burning in northwestern India: validation and sources of error. American Geophysical Union Fall Meeting, New Orleans, LA, December 12, 2017. (Talk)

[4] **Liu, T.**, M.E. Marlier, R.S. DeFries, A. Karambelas, D.M. Westervelt, K.R. Xia, A.M. Fiore, L.J. Mickley, and D.H. Cusworth. Contributions of winter outdoor biomass burning to air quality in Delhi and reevaluation of agricultural burned area in northwest India. Planetary Health/GeoHealth Inaugural Meeting, Boston, MA, April 29, 2017. (Poster)

[3] **Liu, T.**, R.W. Schmitt, and L. Li. Global salinity predictors of western United States precipitation. American Geophysical Union Fall Meeting, San Francisco, CA, December 16, 2016; Woods Hole Oceanographic Institution, Department of Physical Oceanography, August 18, 2016. (Talk)

[2] **Liu, T.**, J.F. McManus, K. Costa, and T. Liu. A glacial-interglacial record of the North Pacific biological pump for the past 600,000 years. Ocean Sciences Meeting, New Orleans, LA, February 23, 2016. (Poster)

[1] **Liu, T.**, J.E. Nichols, D.M. Peteet, C.M. Moy, J. Crusius, and A.W. Schroth. Leaf wax *n*-alkane distributions, stable isotope ratios, paleovegetation, and dust flux to reconstruct North Pacific climate during the last 2,000 years. American Geophysical Union Fall Meeting, San Francisco, CA, December 18, 2014. (Poster)

OTHER ATTENDED CONFERENCES AND WORKSHOPS

Climate and Wildfire Related Air Quality and Public Health Impacts Workshop, May 2024
UCLA Sustainable LA Grand Challenge, *Invited* (UCLA, Los Angeles, CA)
Panelist on "Making the Models Work: Leveraging Observational and Modeling Data to Study Public Health Impacts"

7th International Fire Behavior and Fuels Conference, *Invited* (Boise, ID) April 2024

Lightning Talk on "Leveraging geostationary satellite observations for hourly mapping of large wildfire progression"

Geo for Good Summit (Google, Mountain View, CA) October 2023
Lightning Talk in "Climate Change Adaptation" session

Geo for Good Summit (Google, Mountain View, CA) October 2022
Geo for Good Summit (Google, virtual) November 2021
Geo for Good Summit (Google, virtual) October 2020
13th Graduate Climate Conference (Woods Hole, MA) November 2019
Geo for Good Summit (Google, Sunnyvale, CA) September 2019
Demo Pod on "SMOKE Policy Tool for Indonesian Fires"

Air Pollution Extremes Workshop (Columbia University, New York, NY) November 2018
Google Earth Engine User Summit (Google, Dublin, Ireland) June 2018
Google Earth Engine Advanced Workshop (Google, Cambridge, MA) March 2018
"Fire Prediction Across Scales" Conference (Columbia University, New York, NY) October 2017

RESEARCH FUNDING

Grants

"Tracking land management policy and implementation for wildland fires across North America." UBC Hampton New Faculty Grant, 2025-2027. (PI: $15,000 CAD)

"Calibration of Fatty Alcohols as a Paleotemperature Proxy." Lamont-Doherty Earth Observatory Climate Center, 2015. (PI: $9,140 USD)

Contracts

"Validation and contextualization of WildFireSat Tier 2 algorithms." WildFireSat, Natural Resources Canada, 2025-2026. ($40,000 CAD)

Fellowships

"Sensitivity of western United States wildfires to new climate extremes: Implications for public health and aviation." NOAA C&GC Postdoctoral Fellowship, 2022-2024. ($159,000 USD)

"High-resolution atmospheric modeling of indoor and outdoor air pollution and public health effects in India." NSF Graduate Student Fellowship, 2017-2022. ($138,000 USD)

Undergraduate Research Support

Winter Arts Undergraduate Research Awards (WAURA), UBC, Winter 2025 ($3,000 CAD)

Arts Undergraduate Research Awards (AURA), UBC, Summer 2025 ($3,000 CAD)

Enhanced Science Undergraduate Research Experience Awards (EnSURE), UBC, Summer 2025 ($3,500 CAD)

Travel Awards

GSAS Professional Development Fund, Harvard University, September 2019. ($3000 USD)
Young Investigator Award, Columbia University, December 2016. ($650 USD)
WHOI Summer Student Fellow Travel Award, November 2016. ($1000 USD)

PROFESSIONAL SERVICE AND AFFILIATIONS

International

Session Convener at American Geophysical Union Fall Meeting (December 2019-20, 2022-23, 2025)

"Air Pollution Extremes in South and Southeast Asia: Observations, Modeling, and Impact Studies"
- co-convener in 2019 & 2022, primary convener in 2020, OSPA chair in 2022-23

"Prescribed Fires and Land Management in North America"
- co-convener in 2023

"Characterizing wildland fire smoke: estimating exposure and associated impacts to public health" - co-convener in 2025

OSPA Judge at American Geophysical Union Fall Meeting (December 2022-23)

Member of American Geophysical Union (2014 – present), American Meteorological Society (2023 – present), Association for Fire Ecology (2023 – present), Society for Industrial and Applied Mathematics (2024 – present), Phi Beta Kappa (2017 – present)

Peer reviewer for scientific journals, including *Remote Sensing of Environment*, *PNAS*, *Nature Communications*, *Environmental Research Letters*, *ES&T*, *Scientific Data*, *Atmospheric Environment*, *Atmospheric Chemistry & Physics*, *International Journal of Wildland Fire*, *Water Resources Research*, *Communications Earth & Environment*, *Environmental Research Communications*, and *ISPRS*

National

Member of WildFireSat User & Science Team (2025-)

Moderator at "Greenhouse Gas Emissions from Wildland Fires: Toward Improved Monitoring, Modeling, and Management" workshop, National Academies of Sciences, Engineering, and Medicine, Washington D.C. (September 13-15, 2023)

Proposal reviewer for *NASA Earth Sciences* (2024, 2025)

University

Member of Geography Computing Committee, UBC (2025-)

Member of Geography BSc Major Committee, UBC (2025-)

MENTORING

Graduate Students

University of British Columbia
PhD Students: Benjamin Hartvigsen (2025-, EOAS, co-supervised with Roland Stull)
MSc Students: Marina Tornorsam (2025-, Geography, co-supervised with Naomi Schwartz)
Committee Member: Yajie Qu (PhD, Geography), Hugo Dignoes Ricart (PhD, Mech Eng.)
Examiner: Rachel Pekelney (MSc, Forestry)

Undergraduates and Postbacs

University of British Columbia
Undergraduates: Dayshaun Lee (EnSURE, Summer 2025), Kento Otobe (AURA, Summer 2025), Miki Kimura (Summer 2025), Wanying Zheng (Work Learn, Winter 2025), Rachmania Ulwani (Directed Studies, Winter 2025)

University of California, Irvine
Postbacs: Andrea Delgado (CLIMATE Justice Initiative, 2023-2024)

Harvard University
Undergraduates: Kenith Taukolo (HCRP, 2025), Karina Chung (PRISE and HCRP, 2023-2024), Marie Panday (OEB REU, 2021), Miah Caine (HUCE and HCRP, 2020-2021), Kent Toshima (HUCE, 2020-2021), Catherine Liang (EPS Short-Term Summer Program, 2020)

TEACHING EXPERIENCE

Instructor at University of British Columbia

- GEOS_V 370: Advanced Geographic Information Science (2024W T2, 2025W T1)
- GEOS_V 200/APBI_V 244: Introduction to Atmospheric Environments (2025W T1)

Guest Lecturer

- "Weather and Climate", UBC, EESC_O 112: Environmental Earth Science (January 16, 2026)

- "Wildfires", UCLA, GEOG255: Physical Basis of Geography (November 27, 2024)

Teaching Fellow at Harvard University for SPU 12/GENED 1098: Natural Disasters
Spring 2019, Spring 2020, Fall 2020

- Led weekly 2-hour lab sections (computer-based labs using ArcGIS + practical experiment labs); other responsibilities included exam review/proctoring, creating exam questions, holding weekly office hours, and grading, adapting GIS labs for open-source software (QGIS and Google Earth Engine) and online learning, creating two new labs on fires and COVID-19, and training other TFs/TAs in August 2020 on GIS labs

SYNERGISTIC ACTIVITIES

Activities

Presenter, "Geography Majors and Minors Evening," UBC	October 28, 2025
Volunteer, "Faculty of Science, Meet Your Major," Geography booth, UBC	March 3, 2025
Panelist, "Navigating the Academic Ladder: Insights from New Faculty," UC Irvine	May 9, 2024
PROGRESS Mentor, UC Irvine	2024
Postdoc representative, ESS Inclusive Excellence Committee, UC Irvine	2023 – 2024
Lead organizer, ACMG Undergraduate Research Symposium, Harvard University	Summer 2020, 2021
EPS Day co-organizer, Harvard University	May 2019
Participant, Science-A-Thon	October 2018, 2019
Speaker ambassador, Inaugural Planetary Health/ GeoHealth Meeting	April 2017
Blog content manager, writer, and reviewer, Columbia Science Review	2014 – 2016
Volunteer, Columbia Astronomy Public Outreach, Columbia University	2016
Volunteer, Discovery Science Center, Santa Ana, CA	2012 – 2013
Creator, writer, "The Cosmos", astronomy blog	2012 – 2013

Articles

Liu, T. "A Bird's-Eye View of Earth: Petabytes of Satellite Data at Our Fingertips." *Science in the News*, Harvard University. April 14, 2020. [Link]

Liu, T. "Living in a World of Extreme Droughts, Floods, and Storms." *Science in the News*, Harvard University. September 27, 2019. [Link]

Liu, T., M.E. Marlier, J.J. Buonocore, L.J. Mickley, and R.S. DeFries. "We built an app to detect areas most vulnerable to life-threatening haze." *The Conversation Indonesia*. September 9, 2019. [Link]

Liu, T. "It's Time to Value Disappearing Wetlands." *Columbia Science Review*, Columbia University. Spring 2016. [Link]

Liu, T. "Finding Serenity Through Research." *Columbia to the Core*, Columbia University. July 15, 2015. [Link]

Selected Press Coverage

NASA Earth Observatory (January 22, 2025) [article]

The Washington Post (November 22, 2024) [article]

Lakshmi Mittal and Family South Asia Institute, Harvard University. [Research Profile (May 4, 2022), Newsletter (July 8, 2021)]

"The Health Impact from Peatland and Forest Fires," Katadata Forum (August 13, 2019). Jakarta, Indonesia. [Katadata Microsite, local press coverage from ~30 news agencies, including *CNN Indonesia* (In Bahasa Indonesia)]

Selected Media Outreach

Canada's National Observer (February 7, 2025) [article]

The Times-Picayune/The New Orleans Advocate (October 24, 2023) [article]