

Derek V. Mallia, Ph.D.

Dept. of Atmospheric Sciences, University of Utah
135 S 1460 E, Room 819, Salt Lake City, UT 84112

Phone: (631) 827-9170

Email: [Derek.Mallia \[at\] utah.edu](mailto:Derek.Mallia[at]utah.edu)

Research Statement:

Topics that I am most interested in have strong linkages to climate change and air quality. My most recent research has primarily focused on using atmospheric models to elucidate key processes that drive wildfire behavior and smoke dispersion, and wind-blown dust. Better understanding how climate change will impact wildfire behavior and smoke transport is also of interest to my research group. I also have a general interest in using atmospheric and chemical transport models developed for research and repurposing them for forecasting applications.

Education:

University of Utah	Ph.D. (Atmospheric Sciences)	2018	Salt Lake City, UT
Plymouth State University	M.S. (Applied Meteorology)	2012	Plymouth, NH
University at Albany	B.S. (Atmospheric Sciences)	2010	Albany, NY

Employment:

Research Assistant Professor, University of Utah, Salt Lake City, UT, 2020 – Present.

Co-Founder, TraceAQ, Salt Lake City, UT, 2025 – Present.

Adjunct Faculty, Salt Lake Community College, Salt Lake City, UT, 2013 – Present.

Postdoctoral Research Associate, University of Utah, Salt Lake City, UT, 2018 – 2020.

Graduate Research Assistant, University of Utah, Salt Lake City, UT, 2012 – 2017.

Graduate Research Assistant, Plymouth State University, Plymouth, NH, 2010 – 2012.

Student Intern, National Weather Service, Albany, NY, 2008 – 2010.

Grants Support History: (PI = \$1.08M; Co-PI/I = \$2.6M; **Total = \$3.68M**)

Current Projects:

PI Status	Amount	Agency	Title	Years
Co-PI	\$185,043	NSF	Collaborative Research: Assessing current and future dust flux from the Northern Great Plains, U.S. with extreme climate variability and insights from the 1930s Dust Bowl drought	2025-2028
Co-I	\$399,733	Utah Division of Natural Resources	Options and Costs for Great Salt Lake Dust Control	2024-2025
PI	\$478,331	Naval Research Laboratory	Improving Methods for Forecasting Aerosols within U.S. Navy Aerosol Prediction Systems	2024-2027
PI	\$85,943	Utah Division of Air Quality	Projecting the Impacts of a Shrinking Great Salt Lake on Dust Exposure Along the Wasatch Front	2024-2025

PI	\$ 35,285	USGS	Projecting dust exposure from western U.S. reservoirs	2024-2029
Co-PI	\$186,287	NASA	Technology Development to Integrate Innovative Observation Capabilities into Coupled Wildfire Models for Improved Active Fire Forecasting	2023-2026
Co-I	\$989,398	NSF	Community Resilience through Engaging, Actionable, Timely, High - REsolution Air Quality Information (CREATE-AQI)	2023-2024
Co-PI	\$107,495	NASA	Distributed Spacecraft with Heuristic Intelligence to monitor Wildfire Spread for Responsive Control	2023-2026
Co-I	\$428,000	NOAA	Methane Emissions from Energy Production to Consumption: multi-scale testbed in the Uinta and Salt Lake Basins	2023-2026
PI	\$399,904	NOAA	Tracking Impacts of COVID-19 Lockdowns & Recovery on Urban Atmospheric Composition at Neighborhood Scales with Public-Transit Based Measurements	2020-2023

Completed Projects:

PI Status	Amount	Agency	Title	Years
Co-I	\$30,000	1U4U Innovation Funding	Surgery in the Pyrocene: Examining the Risk of Wildfire Smoke to Perioperative Patient Populations in the Mountain West	2023-2024
PI	\$156,600	University of Utah	Western U.S. Smoke Forecasting	2023-2024
Co-I	\$49,994	NSF	Community Resilience through Engaging, Actionable, Timely, High - REsolution Air Quality Information (CREATE-AQI)	2022-2023
Co-I	\$69,320	University of Utah	Quantifying the carbon and air quality footprint of the University of Utah using TRAX-mounted instrumentation, traffic, and tap-on/tap-off ridership data	2022-2023
Co-PI	\$79,768	Utah Division of Air Quality	Quantitative Attribution of Wildfires on Summertime Ozone Concentrations along the Wasatch Front	2020-2022

Summary of Teaching Experience:

Course	Title	Semesters Taught
ATMOS 5010	Weather Forecasting	F22
ATMOS 5120	Weather Discussion	Sp21, Sp22, Sp23, Sp24, Sp25
ATMOS 1010	Severe and Unusual Weather	F20, Sp21, F22
ATMOS 5110	Synoptic Meteorology I	F22
ATMOS 5210	Synoptic Meteorology II	Sp21, Sp22, Sp23, Sp24, Sp25
ATMOS 5340	Environmental Programming &	F20, F21, F23, F24

	Statistics	
ATMO 1010 (Salt Lake Community College)	Severe and Hazardous Weather	Sp14, F14, Sp15, F15, Sp16, F16, Sp17, F17, Sp18, F18, Sp19, F19, Sp20, F20, Sp21, F21, Sp22, F22, Sp23, F23, Sp24, F24

Graduate Student and Postdoc Supervision:

Cambria White, M.S., Dept. Atmospheric Sciences – Current

Taylor (Kai) Wilmot, PostDoc, Dept. Atmospheric Sciences – 2022 to 2024

Andres Eduardo Gonzalez Vidal, PostDoc, Dept. Atmospheric Sciences – 2021 to 2023

Graduate Student Supervisory Committee Service:

James Mineau, Ph.D., University of Utah, Dept. Atmospheric Sciences – Current

Tristalee Mangin, Ph.D., University of Utah, Dept. Chemical Engineering – Current

Jingting Huang, Ph.D., University of Utah, Dept. Chemical Engineering – 2024

Kathleen Clough, M.S., San Jose State University, Wildfire Interdisciplinary Research Center – 2023

Kimberly Bestul, M.S., University of Utah, Dept. Atmospheric Sciences – 2022

Student Mentorship:

Ilinca Mocuta, University of Utah's Experimental Learning Program – 2024 to present

Sam Christensen, TraceAQ Internship – 2024 to present

James Mineau, NSF Research Experiences for Undergraduates – 2021

Linda Arterburn, NSF Research Experiences for Undergraduates – 2021

Brittany Whitlam, University of Utah's Experimental Learning Program – 2020 to 2022

Publications: (N = 40; H-index = 19; Citations = 1075) **Underlines denote an author under my supervision*

Peer Reviewed Articles:

Lang, O. P. Naple, **D. V. Mallia**, T. Hosler, B. Adams, and S. Skiles, Two decades of dust radiative forcing on snow cover across the Great Salt Lake Basin. *J. Geophysical Res. Earth Surface*, In Press.

Munroe, J. S., G. T. Carling, K. D. Perry, D. P. Fernandez, and **D. V. Mallia**, Mixing of natural and urban dust along the Wasatch Front of northern Utah, USA. *Scientific Reports*, In Press.

Brahney, J., **et al.**, Dust in the Critical Zone: North American case studies. *Earth Science Reviews*, 258, 104942, 2024.

Mendoza, D. L., T. M. Benney, E. T. Crosman, R. Bares, **D. V. Mallia**, C. S. Pirozzi, A. L. Freeman, and S. Boll, Using indoor and outdoor measurements to understand building protectiveness to wildfire, atmospheric inversion, and firework PM_{2.5} pollution events. *Environments*, 11, 186, 2024.

Gonzalez, A., **D. V. Mallia**, J. C. Lin, L. Mitchell, T. Y. Wilmot, N. Daher, M. Sghiatti, and C. Harkins, Examining the sensitivity of ozone to NO_x and VOCs in the Salt Lake City urban region from spatiotemporal patterns observed using stationary and mobile observations collected from a light-rail public transit platform. *Atmos. Environ.*, 334, 120686, 2024.

Grineski, S., **D. V. Mallia**, T. W. Collins, M. Araos, J. C. Lin, W. R. L. Anderegg, and K. Perry, Harmful dust from drying lakes Health and equity implications of adaptation pathways for the Great Salt Lake, USA. *One Earth*, 7, 1056–1067, 2024.

Shaddy, B., D. Ray, A. Farguell, V. Calaza, J. Mandel, J. Haley, K. Hillburn, **D. V. Mallia**, A. Kochanski, and A. Oberai, Generative algorithms for fusion of physics-based wildfire spread models with satellite data for initializing wildfire forecasts. *Artificial Intelligence for the Earth Systems*, 3, 2024.

Kochanski, A., K. Clough, A. Farguell, **D. V. Mallia**, J. Mandel, and K. Hilburn: Assimilating fire perimeters into a coupled fire-atmosphere model. *Front. For. Glob. Change*, 6:1203578, 2023.

Munroe, J. S., E. J. Soderstrom, C. L. Kluetmeier, M. J. Tappa, **D. V. Mallia**, and A. M. Bauer: Local sources control dust in the mountain critical zone of the Great Basin and Rocky Mountains, USA. *Environ. Res. Lett.*, 18 104034, 2023.

Lang, O. I., **D. V. Mallia**, and S. M. Skiles: The shrinking Great Salt Lake contributes to record high dust-on-snow deposition in the Wasatch Mountains. *Environ. Res. Lett.*, 18 064045, 2023.

Mallia, D. V., L. E. Mitchell, A. E. G. Vidal, D. Wu, L. Kunik, and J. C. Lin: Can we detect urban-scale CO₂ emission changes within medium-sized cities? *J. Geophys. Res. Atmos.*, 128, e2023JD038686, 2023. *Selected for AGU's Editor Highlight on Eos.*

Mallia, D. V., and A. K. Kochanski: A review of different modeling approaches used to simulate smoke transport and dispersion. *Fire, Smoke and Health: tracking the modeling chain from flames to health and wellbeing*. American Geophysical Union, edited by T. Loboda, N. French, and R. Puet., DOI: <https://doi.org/10.1002/essoar.10512025.1>, 2023.

Roten, D., E. Kort, T. Oda, L. Kunik, D. Wu, **D. V. Mallia**, J. C. Lin, The information content of dense carbon dioxide measurements from space: A high-resolution inversion approach with synthetic data from the OCO-3 instrument. *Atmos. Chem. Phys. Discuss.*, 1–43, 2022.

Wilmot, K., **D. V. Mallia**, A. G. Haller, and J. C. Lin: Wildfire activity is driving summertime air quality degradation across the Western US: A model-based attribution to smoke source regions. *Environ. Res. Lett.*, 17, 114014, 2022.

Wilmot, K., **D. V. Mallia**, A. G. Haller, and J. C. Lin: Wildfire plumes in the Western US are reaching greater heights and injecting more aerosols aloft under a changing climate. *Scientific Reports*, 12, 12400, 2022.

Sim, S., H. Lee, Haeyoung, E. Oh, S., Kim, P. Ciais, S. Piao, J. C. Lin, **D. V. Mallia**, S. Lee, Y. Kim, H. Park, and S. Jeong: Short-term reduction of regional enhancement of atmospheric CO₂ in China during the first COVID-19 pandemic period. *Environ. Res. Lett.*, 17, 024036, 2022.

Moody, M., J. Gibbs, S. Krueger, **D. V. Mallia**, E. Pardyjak, A. K. Kochanski, B. Bailey, and R. Stoll: QES-Fire: a dynamically-coupled fast-response wildfire model. *Int. J. Wildland Fire*, 31(3), 306–325, 2022.

Haller, A.G. **et al.**: Coupled air quality and boundary-layer meteorology in western U.S. basins during winter: Design and rationale for a comprehensive study. *BAMS*, 102(10), 2012–2023, 2021.

Kochanski, A. K., F. Herron-Thorpe, **D. V. Mallia**, J. Mandel and J. K. Vaughan: Integration of a coupled fire-atmosphere model into a regional air quality forecasting system for wildfire events. *Front. For. Glob. Change*, 4:728726, 2021.

Farguell, A., J. Mandel, J. Haley, **D. V. Mallia**, A. K. Kochanski, and K. Hilburn: Machine learning estimation of fire arrival time from level-2 active fire satellite data. *Remote Sensing*, 13(11), 2203, 2021.

Wilmot, K. T., A. G. Haller, J. C. Lin, and **D. V. Mallia**: Expanding number of western US urban centers face declining summertime air quality due to enhanced wildland fire activity. *Environ. Res. Lett.*, 16, 054036, 2021.

Herrera, S. A., G. S. Diskin, C. Harward, G. Sachse, S. F. J. De Wekker, M. Yang, Y. Choi, A. Wisthaler, **D. V. Mallia**, and S. E. Pusede: Wintertime nitrous oxide emissions in the San Joaquin Valley of California estimated from aircraft observations. *Environ. Sci. Technol.*, 55, 8, 4462–4473, 2021.

Mallia, D. V., L. Mitchell, L. Kunik, B. Fasoli, R. Bares, D. Mendoza, K. Gurney, and J. C. Lin: Constraining urban CO₂ emissions using mobile observations derived from a novel light-rail public transit platform. *Environ. Sci. Technol.*, 54, 24, 15613–15621, 2020.

Mallia, D. V., A. Kochanski, K. E. Kelly, R. Whitaker, W. Xing, L. Mitchell, A. Jacques, A. Farguell, J. Mandel, P.-E. Gaillardon, T. Becnel, and S. Krueger: Evaluating wildfire smoke transport within a coupled fire-atmosphere model using a high-density observation network for an episodic smoke event along Utah's Wasatch Front. *J. Geophys. Res.*, 125, e2020JD032712, 2020.

Mallia, D. V., A. Kochanski, S. Urbanski, J. Mandel, A. Farguell, and S. Krueger: Incorporating a canopy parameterization within a coupled fire-atmosphere model to improve a smoke simulation for a prescribed burn. *Atmosphere*, 11(8), 832, 2020.

Kunik, L., **D. V. Mallia**, K. R. Gurney, D. L. Mendoza, T. Oda, and J. C. Lin: Bayesian inverse estimation of urban CO₂ emissions: Results from a synthetic-data simulation over Salt Lake City, UT. *Elementa*, 7(1), 36, 2019.

Kochanski, A., **D. V. Mallia**, M. Fearon, T. Brown, A. H. Souri, and J. Mandel: Modeling wildfire smoke feedback mechanisms using a coupled fire-atmosphere model with a radiatively active aerosol scheme. *J. Geophys. Res. Atmos.*, 124(16), 9099–9116, 2019.

Hernandez, A. J., L. A., Rincon, D. Wu, **D. V. Mallia**, J. C. Lin, and R. Jimenez: Transboundary transport of biomass burning aerosols and photochemical pollution in the Orinoco River Basin. *Atmos. Environ.*, 205, 1–8, 2019.

Skiles, S. M., **D. V. Mallia**, A. G. Hallar, J. C. Lin, A. Lambert, R. Peterson, and S. Clark: Implications of a shrinking Great Salt Lake for dust on snow deposition in the Wasatch Mountains, UT: A source to sink case study from the April 13th, 2017 dust event. *Environ. Res. Lett.*, 13, 124031, 2018.

Mallia, D. V., A. Kochanski, S. Urbanski, and J. C. Lin: Optimizing smoke and plume rise modeling approaches at local scales. *Atmosphere*, 9, 116, 2018.

Mitchell, L. E., J. C. Lin, D. R. Bowling, D. E. Pataki, C. Strong, A. J. Schauer, R. Bares, S. E. Bush, B. B. Stephens, D. Mendoza, **D. V. Mallia**, L. Holland, K. R. Gurney, and J. R. Ehleringer: Long-term urban carbon dioxide observations reveal spatial and temporal dynamics related to urban characteristics and growth. *Proc. Natl. Acad. Sci. U.S.A.*, 114, 2912–2917, 2018.

Davison, J. H., H-T. Hwang, E. A. Sudicky, **D. V. Mallia**, and J. C. Lin: Full coupling between the atmosphere, surface, and subsurface for an integrated hydrologic simulation. *J. Adv. Model. Earth Syst.*, 10,

43–53, 2018.

Foster, C. S., E. T. Crosman, L. Holland, **D. V. Mallia**, B. Fasoli, R. Bares, J. Horel, and J. C. Lin: Confirmation of elevated methane emissions in Utah’s Uintah Basin with ground-based observations and a high-resolution transport model. *J. Geophys. Res. Atmos.*, 23, 13026–13044, 2017.

Mallia, D. V., A. Kochanski, C. Pennell, W. Oswald, and J. C. Lin, Wind-blown dust modeling using a backward Lagrangian particle dispersion model. *J. Appl. Meteor. Climate.*, 56, 2845–2867, 2017.

Lin, J. C., **D. V. Mallia**, D. Wu, and B. Stephens: How can mountaintop CO₂ observations be used to constrain regional carbon fluxes? *Atmos. Chem. Phys.*, 17, 5561–5581, 2017.

Mallia, D. V., J. C. Lin, S. Urbanski, J. Ehleringer, and T. Nehrkorn: Impacts of upwind wildfire emissions on CO₂, CO, and PM_{2.5} concentrations in Salt Lake City, Utah. *J. Geophys. Res. Atmos.*, 120(1), 147–166, 2015.

Good S. P., **D. V. Mallia**, E. H. Denis, K. H. Freeman, X. Feng, S. Li, N. Zegre, J. C. Lin, and G. J. Bowen: High frequency trends in the isotopic composition of Superstorm Sandy. *Learning from the Impacts of Superstorm Sandy*. Elsevier, edited by J. B. Bennington and E. C. Farmer, <https://doi.org/10.1016/B978-0-12-801520-9.00004-3>, 2014.

Good S. P., **D. V. Mallia**, G. Bowen, and J. C. Lin: Stable isotope analysis of precipitation samples obtained via crowdsourcing reveals the spatiotemporal evolution of Superstorm Sandy. *PLoS One*, 9, e91117, 2014.

Peer Reviewed Conference Proceedings:

Mandel, J., M. Vejmelka, A. K. Kochanski, A. Farguella, J. D. Haley, **D. V. Mallia**, and K. Hilburn: An interactive data-driven HPC system for forecasting weather, wildland fire, and smoke. *Proceedings of UrgentHPC: The first international workshop on HPC for urgent decision making*, doi:10.1109/UrgentHPC49580.2019.00010, 2019.

Kochanski, A. K., **D. V. Mallia**, M. G. Fearon, T. Brown, J. Mandel, and J. K. Vaughan: Do we need weather prediction models to account for local weather modifications by wildland fires? *Advances in Forest Fire Research*. University of Coimbra, edited by D. X. Viegas, https://doi.org/10.14195/978-989-26-16-506_108, 2018.

Other publications:

Mallia, D. V.: Western US wildfires in an increasingly warming climate. *Physics Today – Research and Technology*, doi:10.1063/PT.5.4021. May 25th, 2016.

In Preparation/Submitted:

Mallia, D. V., A. K. Kochanski, C. White, A. Farguella, and J. Mandel, Simulating the impacts of regional wildfire smoke on ozone using a coupled fire-atmosphere-chemistry model (WRF-SFIRE-Chem). *J. Geophys. Res. Atmos.* In Revision.

Davison, J. H., H-T. Hwang, E. A. Sudicky, **D. V. Mallia**, and J. C. Lin: Analysis of the California Basin Model. *OneEarth*, In Review.

Brahney, J., E. Hammill, **D. V. Mallia**, J. Nielson, K. Roper, and R. Martin, Do atmospheric particulate aerosols facilitate the transport of viruses? A SARS-CoV-2 case study. *PLOS One*, Submitted.

Invited Presentations and Seminars: (N = 15)

San Jose State University: Wildfire smoke across the Western US: The past, present, and future, San Jose, CA, October 2024.

Pacific Northwest National Laboratory: Drivers behind warm season PM_{2.5} trends along the Wasatch Front, Online, August 2023.

Wilkes Climate Summit: Elucidating the impacts of wildfire smoke on air quality across the Western U.S., Salt Lake City, UT, May 2023.

39th Annual Utah Conference on Safety and Industrial Hygiene: The past, present, and the future of wildfire smoke across the Intermountain West, Salt Lake City, UT, October 2022.

Massachusetts Institute of Technology - Wildfire and Air Quality Virtual Panel: Simulating wildfire smoke using a high-resolution weather model. Online, November 2021.

18th Annual Climate Prediction Applications Science Workshop: Air quality research and applications: urban greenhouse gases. Online, April 2021.

University of Utah, Seminar: Modeling wildfire smoke across the Intermountain West. Online, March 2021.

Weber State University, Geoscience and Society Seminar Series: Climate change, wildfires, air quality, and the Intermountain West. Online, March 2021.

University of Toronto, Seminar: Modeling wildfire smoke across North America in a new wildfire regime. Online, November 2020.

NOAA Air Resources Laboratory, 2020 HYSPLIT Workshop: STILT Demonstration. Online, June 2020.

University of California Santa Barbara, EXFHIRE Workshop: Forecasting wildfires using a coupled fire-atmosphere weather prediction model. Santa Barbara, CA, October 2019.

Boston University, CO₂ USA Workshop: Mobile measurements and analyses of data from light rail and Google Street View Cars. Boston, MA, October 2019.

Seoul National University, Seminar: Constraining urban CO₂ emissions using a light-rail public transit platform. Seoul, South Korea, August 2019.

AMS/NWS Utah Chapter: Can we forecast the effects of smoke shading? Salt Lake City, UT, October 2018.

U.S. Forest Service: Integrating wildfire plume rises within atmospheric transport models. Missoula, MT, October 2016.

Select Conference Presentations:

Climate change is expected to increase the frequency of Pyrocumulonimbus across the Western U.S. *AGU Annual Meeting 2024*, Washington D.C., December 2024.

Simulating the impacts of regional wildfire smoke on ozone using a coupled fire-atmosphere-chemistry model. *AGU Annual Meeting 2024*, Washington D.C., December 2024.

Simulating the impacts of regional wildfire smoke on ozone using a coupled fire-atmosphere-chemistry model. *Air Quality: Air Quality: Science for Solutions 2024*, Ogden, UT, March 2024.

Analyzing Wildfire smoke impacts across the Western U.S. using a coupled fire-atmosphere model. *14th Fire and Forest Meteorology Symposium/Sixth Conference*, Minneapolis, MN, May 2023.

Projecting the impacts of a shrinking Great Salt Lake on dust along the Wasatch Front. *1st Annual Symposium on Dust Storms in the Western US*, La Jolla, CA, April 2023.

Warm season PM_{2.5} trends along the Wasatch Front: A Lagrangian modeling perspective. *Air Quality: Air Quality: Science for Solutions 2023*, Salt Lake City, UT, March 2023.

Analyzing Wildfire smoke impacts on urban air quality using a coupled fire-atmosphere model. *AMS 2023: 103rd Annual Meeting*, Denver, CO, January 2023.

Quantifying the Impacts of the COVID-19 Lockdown on Urban Emissions across the Salt Lake Valley. *NOAA GML Global Monitoring Annual Conference 2022*, Online, May 2022.

Using a coupled fire-atmosphere model to simulate smoke impacts on urban air quality, *Air Quality: Air Quality: Science for Solutions 2022*, April 2022.

The importance of resolving small-scale processes and their impacts on large-scale smoke plume dynamics. *13th Fire and Forest Meteorology Virtual Symposium*, Online, May 2021.

Evaluating wildfire smoke transport within a coupled fire-atmosphere model (WRF-SFIRE). *2nd SJSU Fire Weather Research Workshop*, Online, April 2021.

Improving wildfire smoke forecasts through the implementation of a canopy model parameterization. *Air Quality: Air Quality: Science for Solutions 2021*, Online, April 2021.

Evaluating wildfire smoke transport within a coupled fire-atmosphere model using a high-density observation network. *3rd International Smoke Symposium*, Online, April 2020.

Validating wildfire smoke transport within a coupled fire-atmosphere model using a novel high-density instrumentation network. *AGU Annual Meeting 2019*, San Francisco, CA, December 2019.

Can coupled fire-atmosphere models predict smoke-induced inversions from wildfires? *Joint WRF and MPAS User's Workshop 2019*, Boulder, CO, June 2019.

Does wildfire smoke impact local inversions? *AMS 12th Symposium on Fire and Forest Meteorology*, Boise, ID., May 2018

Optimizing smoke and plume rise modeling approaches at local scales, *AMS 12th Symposium on Fire and Forest Meteorology*, Boise, ID, May 2018.

Innovative approaches for modeling smoke impacts from prescribed burns and wildfires, *Conference on Fire Prediction Across Scales*, New York, NY, October 2017.

Modeling the impacts of a desiccating Great Salt Lake on future air quality along the Wasatch Front, *2017*

iUtah Annual Symposium, Logan, UT, July 2017.

Wind-blown dust modeling using a backward Lagrangian particle dispersion model, *Air Quality: Science for Solutions 2017*, Salt Lake City, UT, March 2017.

Integrating wildfire plume rises within atmospheric transport models, *AGU Annual meeting*, San Francisco, CA, December 2016.

Wind-blown dust forecasting using a backward Lagrangian particle dispersion model, *AMS 3rd Conference on Atmospheric Biogeosciences*, Salt Lake City, UT, June 2016.

How can mountaintop CO₂ observations be used to constrain regional carbon fluxes?, *AMS 32nd Conference on Agricultural and Forest Meteorology*, Salt Lake City, UT, June 2016.

Identifying and Quantifying the Impact of Wildfires on Utah's Air Quality, *AMS 11th Symposium on Fire and Forest Meteorology*, Minneapolis, MN, May 2015.

Impacts of upstream wildfire emissions on CO₂, CO, and PM_{2.5} concentrations in Salt Lake City, *16th Conference on Mountain Meteorology*, San Diego, CO, August 2014.

A case study of two extratropical transitions during the 2010 Atlantic Basin Hurricane Season utilizing potential vorticity thinking, *36th Annual Northeastern Storms Conference*, Taunton, MA, March 2011.

Flash flood events associated with Northeastern Cutoff Cyclones. *NWS Eastern Region Flash Flood Conference*, Wilkes-Barre, PA, June 2010.

Awards:

Peer-reviewed paper featured in AGU's Editor Highlight on Eos, 2023.

The Edward J. Zipser Outstanding Graduate Student Award, 2018.

The Columbia Initiative on Extreme Weather and Climate Travel Award, 2017.

Friends of Great Salt Lake Doyle W. Stephens Scholarship, 2016.

Global Change and Sustainability Center's Travel Award, 2014 & 2016.

Global Change and Sustainability Center's Graduate Fellowship, 2012 - 2013

Unidata User's Workshop Travel Award, 2012.

NASA EPSCoR Fellowship, 2010 - 2011.

Extracurricular Activities:

Membership, Affiliations, and Committees

Co-founder of TraceAQ

American Geophysical Union

American Meteorological Society

The Global Change & Sustainability Center

Department of Atmospheric Sciences' Undergraduate Affairs Committee

Journal Reviewer

Journal of Geophysical Research: Atmospheres

Journal of Advances in Modeling Earth Systems

Geophysical Research Letters

Atmosphere

Journal of Applied Meteorology and Climatology
 Environmental Science and Pollution Research
 Environmental Science and Technology
 Weather Analysis and Forecasting
 International Journal of Wildland Fire
 Atmospheric Chemistry and Physics

Public Outreach

Invited to give a presentation on the Great Salt Lake at the Utah State Correctional Facility as part of the University of Utah's Prison Education Project (UPEP), October 22nd, 2024.

Discussed the impacts of climate change on wildfires to Our Saviour's Lutheran Church in Salt Lake City, February 14th, 2024.

Visited the Washing Elementary School in Salt Lake City to teach 3rd graders about Fire Weather, January 23rd, 2023.

Guest speaker for Citizens Climate Lobby's monthly meeting on climate change and wildfires, November 19th, 2019.

Visited the Weilenmann School of Discovery in Park City to teach 6th graders about Fire Weather, March 29th, 2018.

Media Coverage:

2025

- **The Daily Utah Chronical** (January 25th) "*The science behind the Southern California wildfires*": <https://dailyutahchronicle.com/2025/01/25/the-science-behind-the-southern-california-wildfires/>
- **IBM** (January 20th) "*California fires drive race for AI detection tools*": <https://www.ibm.com/think/news/ai-fire-prediction>

2024

- **New Scientist** (December 23rd) "*Monster wildfires are sending more smoke into the stratosphere*": <https://www.newscientist.com/article/2461448-monster-wildfires-are-sending-more-smoke-into-the-stratosphere/>
- **Aspen Public Radio** (August 1st) "*Smoky skies become the new norm in the arid West*": <https://www.aspenpublicradio.org/environment/2024-08-01/smoky-skies-become-the-new-norm-in-the-arid-west>
- **FOX-13** (July 4th) "*A new study shows what areas are impacted more by Great Salt Lake dust*": <https://www.fox13now.com/news/great-salt-lake-collaborative/a-new-study-shows-what-areas-are-impacted-more-by-great-salt-lake-dust>
- **KSL-TV** (July 7th) "*Study shows Great Salt Lake dust impacts some communities disproportionately*": <https://ksltv.com/659093/how-great-salt-lake-dust-impacts-people-of-color/>
- **KSL-TV** (March 29th) "*Air Quality Summit puts focus on Utah air pollution and solutions*": <https://ksltv.com/633738/air-quality-summit-puts-focus-on-utah-air-pollution-and-solutions/>

2023

- **The Batavian** (June 30th) "*Canada fires burning fast, blowing south and ramping up air pollutants in WNY*": <https://www.thebatavian.com/jfbeck99272012/canada-fires-burning-fast-blowing-south-and-ramping-up-air-pollutants-in-wny/635517>

- **The Salt Lake Tribune** (June 16th) “*Great Salt Lake’s dust melted Utah’s ‘greatest snow on earth’ more than two weeks early in 2022*”: <https://www.sltrib.com/news/environment/2023/06/16/great-salt-lakes-dust-melted-utahs/>
- **KSL-TV** (May 20th) “*Smoky air wafts into Utah from Canadian wildfires*”: <https://ksltv.com/552167/smoky-air-wafting-into-utah-from-canadian-wildfires/>
- **The Salt Lake Tribune** (May 19th, 2023) “*Great Salt Lake is still blowing dangerous dust*”: <https://www.sltrib.com/news/environment/2023/05/19/great-salt-lake-is-still-blowing/>

2022

- **KSL-TV** (September 9th) “*Smoky skies could be persistent problem in Utah this fall*”: <https://ksltv.com/505294/smoky-skies-could-be-persistent-problem-in-utah-this-fall/>
- **KSL-TV** (August 31st) “*Summer 2022 relatively smoke-free in Utah, but record heat is hurting air quality*”: <https://www.ksl.com/article/50466820/summer-2022-relatively-smoke-free-in-utah-but-record-heat-is-hurting-air-quality>
- **The Guardian** (August 6th) “*Fire-breathing dragon clouds: a wildfire-fueled phenomenon explained*”: <https://www.theguardian.com/world/2022/aug/05/pyrocumulonimbus-clouds-wildfire-mckinney-fire>
- **LA Times** (August 3rd, 2022) “*McKinney fire has hit the stratosphere, spewing the fire-breathing dragon of clouds*”: <https://www.latimes.com/california/story/2022-08-03/the-mckinney-fire-has-hit-the-stratosphere>
- **KUER** (April 28th) “*The Salt Lake Valley’s dusty week has left us all wheezing*”: <https://www.kuer.org/health-science-environment/2022-04-28/the-salt-lake-valleys-dusty-week-has-left-us-all-wheezing>

2021

- **The Daily Utah Chronicle** (January 30th): “*How To Address Utah’s Wildfires, Air Quality, and Climate Change All at Once*”: <https://dailyutahchronicle.com/2021/01/30/shadley-how-to-address-utahs-wildfires-air-quality-and-climate-change-all-at-once/>

2020

- **FOX-13** (August 21st) “*U of U professor predicts fire and smoke behavior as Western states face increasing threat*”: <https://www.fox13now.com/news/local-news/u-of-u-professor-predicts-fire-and-smoke-behavior-as-western-states-face-increasing-threat>

Technical Skills:

Programming languages: *R, Python, MATLAB, Fortran, Shell, NCL, and html*

Operating systems: *Linux, Mac OS, and Windows*

Modeling experience: *WRF-ARW, WRF-CHEM, WRF-SFIRE, HYSPLIT, STILT, and Freitas plume rise model.*

Other: *Experience with high-performance computing and maintaining code via GitHub.*