
FERNANDO GARCIA MENENDEZ

Associate Professor

Department of Civil, Construction
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North Carolina State University

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EDUCATION

- 2013 **Ph.D. Environmental Engineering**
Georgia Institute of Technology, Atlanta, GA
*Thesis: "High-Resolution Three-Dimensional Plume Modeling with Eulerian
Atmospheric Chemistry and Transport Models"*
Minor: Earth and Atmospheric Sciences
- 2008 **M.S. Civil and Environmental Engineering**
Stanford University, Stanford, CA
Atmosphere/Energy Program
- 2005 **B.S. Chemical Engineering**
Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM)
Monterrey, Mexico
Minor: Environmental Engineering

PROFESSIONAL EXPERIENCE

- 2016 – **North Carolina State University, Raleigh, NC**
Associate Professor (2023-)
Assistant Professor (2016-2023)
 - Department of Civil, Construction and Environmental Engineering
- 2013 – 2015 **Massachusetts Institute of Technology, Cambridge, MA**
Postdoctoral Associate
 - Joint Program on the Science and Policy of Global Change
 - Department of Earth, Atmospheric and Planetary Sciences
- 2008 – 2013 **Georgia Institute of Technology, Atlanta, GA**
Graduate Research Assistant
 - Department of Civil and Environmental Engineering
- 2011 **Natural Resources Defense Council, Washington, D.C.**
Schneider Sustainable Energy Fellow
 - NRDC Climate and Clean Air Program
- 2005 – 2007 **CEMEX, Monterrey, Mexico**
Process Engineer

HONORS AND AWARDS

Invited Participant: U.S.-Africa Frontiers Symposium, National Academies, African Academy of Sciences (2022)

George H. Blessis Outstanding Undergraduate Advisor Award, NCSU (2021)

Gertrude Cox Award for Innovative Excellence in Teaching and Learning with Technology, NCSU (2019)

International Travel Assistance Award, NCSU Office of Global Engagement (2019)

Invited Participant: Arab-American Frontiers Symposium, National Academies, Kuwait Foundation for the Advancement of Science (2018)

CAREER Award, National Science Foundation (2018)

Invited Visiting Scholar, La Salle University, Colombia (2015)

Best Poster Presentation, Annual CMAS Conference (2014)

Invited Participant: National Center for Atmospheric Research Advanced Study Program (2014)

Exceptional Ph.D. Dissertation Award, 2nd Place, Air & Waste Management Association (2014)

Joint Fire Science Program Graduate Research Innovation (GRIN) Award (2012)

Anne Robinson Clough Conference Grant, Georgia Institute of Technology (2012)

Best Student Presentation, 2nd Place, AMS Conference on Air Pollution Meteorology (2012)

Schneider Sustainable Energy Fellowship, Stanford University (2011)

Southern Section of the Air & Waste Management Association Student Scholarship (2010)

Air Quality Research and Study Scholarship, Air & Waste Management Association (2010)

Georgia Chapter of the Air & Waste Management Association Student Scholarship (2009)

Nancy Grant Chamberlain Memorial Scholarship, Stanford University (2007)

Craig P. Dunn Award for Social Entrepreneurship, San Diego State University (2005)

Frisa Entrepreneurship Scholarship Award, ITESM-University of Richmond, VA (2004)

SPONSORED RESEARCH AND EDUCATIONAL PROJECTS

Funded Proposals:

“Supporting climate change mitigation in Latin America by linking reduced deforestation policies to air quality and public health co-benefits”; NCSU and Kenan Institute Research and Innovation Seed Funding Program: 1/2023 - 12/2023, \$32,250

“Southeastern populations impacted by smoke: recent patterns and possible shifts under climate change”; Joint Fire Science Program: 8/2020 - 12/2023, \$ 24,999

“Non-Academic Research Internships for Graduate Students (INTERN)”; National Science Foundation: 8/2021 - 12/2021, \$ 35,089

“Optimal use of grid-connected energy storage to reduce human health impacts”: National Science Foundation: 11/2019 - 10/2023, \$300,000

“Comparing the costs of an operational prescribed burning program to those of unplanned wildfires”; Joint Fire Science Program: 1/2020 - 12/2021, \$ 24,995

“Non-Academic Research Internships for Graduate Students (INTERN)”; National Science Foundation: 8/2019 - 1/2020, \$ 25,939

- “Optimal use of grid-connected energy storage to reduce human health impacts”; NCSU and Kenan Institute Research and Innovation Seed Funding Program: 7/2019 - 6/2020, \$24,990
- “A Modeling and Educational Framework to Support Air Quality Management in a Smoky Atmosphere”; National Science Foundation: 8/2018 - 8/2024, \$500,000
- “Southern Integrated Prescribed Fire Information System for Air Quality and Health Impacts”; Joint Fire Science Program: 8/2016 - 8/2019, \$199,983
- “Machine Learning Approaches for Air Quality Modeling Applications”; NCSU Office of Research, Innovation and Economic Development: 8/2018 - 6/2019, \$12,000
- “Future Ingenieros @ NC State Program”; NCSU Office for Institutional Equity and Diversity: 1/2018 - 6/2018, \$4,000
- “Quantifying Adverse Impacts of Smoke Exposure from the Fall of 2016 Southeast Wildfires on North Carolina Public Health”; NCSU Center for Human Health and the Environment: 8/2017 - 6/2018, \$37,784
- “Fundamentals of Environmental Engineering Redesign”; Critical Path Course Redesign Grants, NC State DELTA: 8/2016 - 6/2018, \$33,647
- “Sensitivity Analysis of Air Quality to Meteorological Data in Fire Simulations”; Joint Fire Science Program: 7/2012 - 7/2013, \$24,995

PUBLICATIONS

Peer-reviewed scientific journal publications:

- Johnson, M. M. and F. Garcia-Menendez. A comparison of smoke modeling tools used to mitigate air quality impacts from prescribed burning (2023). *International Journal of Wildland Fire*, 32 (7) 1162-1173, doi:10.1071/WF22172.
- Luo, Q., F. Garcia-Menendez, H. Yang, R. Deshmukh, G. He, J. Lin, and J. X. Johnson (2023). The health and climate benefits of economic dispatch in China’s power system. *Environmental Science & Technology*, 57 (7), 2898–2906, doi: 10.1021/acs.est.2c05663.
- East, J. D., B. H. Henderson, S. L. Napelenok, S. N. Kopplitz, G. Sarwar, R. Gilliam, A. Lenzen, D. Tong, R. B. Pierce, and F. Garcia-Menendez (2022). Inferring and evaluating satellite-based constraints on NO_x emissions estimates in air quality simulations. *Atmospheric Chemistry and Physics*, 22, 15981–16001, doi:10.5194/acp-2022-435.
- Luo, Q., B. Copeland, F. Garcia-Menendez, and J. X. Johnson (2022). Diverse Pathways for Power Sector Decarbonization Yield Health Co-Benefits, but Fail to Alleviate Air Pollution Exposure Inequities. *Environmental Science & Technology*, 56 (18), 13274–13283, doi: 10.1021/acs.est.2c00881.
- East, J. D., E. Monier, and F. Garcia-Menendez (2022). Characterizing and quantifying uncertainty in projections of climate change impacts on air quality. *Environmental Research Letters*, 17 (9), 094042, doi: 10.1088/1748-9326/ac8d17
- Johnson, M. M. and F. Garcia-Menendez (2021). Uncertainty in health impact assessments of smoke from a wildfire event. *Geohealth*, 6, e2021GH000526, doi: 10.1029/2021GH000526.
- Luo, Q., J. X. Johnson, and F. Garcia-Menendez (2021). Reducing human health impacts from power sector emissions with redispatch and energy storage. *Environmental Research: Infrastructure and Sustainability*, doi: 10.1088/2634-4505/ac20b3.

- Afrin, S. and F. Garcia-Menendez (2021). Potential impacts of prescribed fire smoke on public health and socially vulnerable populations in a Southeastern U.S. state. *Science of the Total Environment*, 794, 148712, doi: 10.1016/j.scitotenv.2021.148712.
- Huang, R., R. Lal, M. Qin, Y. Hu, A. G. Russell, M. T. Odman, S. Afrin, F. Garcia-Menendez, and S. M. O'Neill (2021). Application and Evaluation of a Low-cost PM Sensor and Data Fusion with CMAQ Simulations to Quantify the Impacts of Prescribed Burning on Air Quality in Southwestern Georgia, USA. *Journal of the Air & Waste Management Association*, doi: 10.1080/10962247.2021.1924311.
- East, J., J. S. Montealegre, J. E. Pachon, and F. Garcia-Menendez (2021). Air quality modeling to inform pollution mitigation strategies in a Latin American megacity, *Science of the Total Environment*, 776, 145894, doi: 10.1016/j.scitotenv.2021.145894.
- Altshuler, S.L., Q. Zhang, M. T. Kleinman, F. Garcia-Menendez, C. T. Moore, M. L. Hough, E. D. Stevenson, J. C. Chow, D. A. Jaffe, and J. G. Watson (2020). Wildfire and prescribed burning impacts on air quality in the United States, *Journal of the Air & Waste Management Association*, 70 (10), 961-970, doi: 10.1080/10962247.2020.1813217.
- Afrin, S. and F. Garcia-Menendez (2020). The influence of prescribed fire on fine particulate matter pollution in the Southeastern United States. *Geophysical Research Letters*, 47, (15), e2020GL088988, doi: 10.1029/2020GL088988.
- Kumar, P., A. A. Adelodunb, M. F. Khan, H. Krisnawati, and F. Garcia-Menendez (2020). Towards an improved understanding of greenhouse gas emissions and fluxes in tropical peatlands of Southeast Asia. *Sustainable Cities and Society*, 53, 101881, doi: 10.1016/j.scs.2019.101881
- Johnson Gaither, C., S. Afrin, F. Garcia-Menendez, M. T. Odman, R. Huang, S. Goodrick, and A. R. da Silva (2019). African American Exposure to Prescribed Fire Smoke in Georgia, USA. *International Journal of Environmental Research and Public Health*, 16 (7), 3079, doi: 10.3390/ijerph16173079.
- Pienkosz, B., R. K. Saari, E. Monier, and F. Garcia-Menendez (2019). Natural variability in projections of climate change impacts on fine particulate matter pollution. *Earth's Future*, 7 (7), 762-770, doi: 10.1029/2019EF001195.
- Saari, R. K., Y. Mei, E. Monier, and F. Garcia-Menendez (2019). Effect of Health-related Uncertainty and Natural Variability on Health Impacts and Co-Benefits of Climate Policy. *Environmental Science & Technology*, 53 (3), 1098-1108, doi: 10.1021/acs.est.8b05094.
- Brown-Steiner, B., N. E. Selin, R. Prinn, E. Monier, S. Tilmes, L. Emmons, and F. Garcia-Menendez (2018). Maximizing Ozone Signals Among Chemical, Meteorological, and Climatological Variability, *Atmospheric Chemistry and Physics*, 18 (11), 8373-8388, doi: 10.5194/acp-18-8373-2018.
- Garcia-Menendez, F., E. Monier, and N. E. Selin (2017). The role of natural variability in projections of climate change impacts on U.S. ozone pollution, *Geophysical Research Letters*, 44 (6), 2911-2921, doi: 10.1002/2016GL071565.
- Garcia-Menendez, F., R. K. Saari, E. Monier, and N. E. Selin (2015). U.S. air quality and health benefits from avoided climate change under greenhouse gas mitigation. *Environmental Science & Technology*, 49 (13), 7580-7588, doi: 10.1021/acs.est.5b01324.
- Garcia-Menendez, F., Y. Hu, and M. T. Odman (2014). Simulating smoke transport from wildland fires with a regional-scale air quality model: Sensitivity to spatiotemporal allocation of fire emissions. *Science of the Total Environment*, 493, 544-553, doi: 10.1016/j.scitotenv.2014.05.108.

- Garcia-Menendez, F., Y. Hu, and M. T. Odman (2013). Simulating smoke transport from wildland fires with a regional-scale air quality model: Sensitivity to uncertain wind fields. *Journal of Geophysical Research*, 118 (12), 6493–6504, doi: 10.1002/jgrd.50524.
- Garcia-Menendez, F. and M. T. Odman (2011). Adaptive Grid Use in Air Quality Modeling. *Atmosphere*, 2 (3), 484-509, doi: 10.3390/atmos2030484.
- Achtemeier, G. L., S. A. Goodrick, Y. Liu, F. Garcia-Menendez, Y. Hu and M. T. Odman (2011). Modeling Smoke Plume-Rise and Dispersion from Southern United States Prescribed Burns with Daysmoke. *Atmosphere*, 2 (3), 3358-388, doi: 10.3390/atmos2030358.
- Garcia-Menendez, F., A. Yano, Y. Hu and M. T. Odman (2010). An adaptive grid version of CMAQ for improving the resolution of plumes. *Atmospheric Pollution Research*, 1 (4), 239-249, doi: 10.5094/APR.2010.031.

Scientific journal publications under peer-review:

- Luo, Q., F. Garcia-Menendez, J. Lin, G. He, J. X. Johnson. Accelerating China's power sector decarbonization can save lives: integrating public health goals into power sector investment decisions. Under review in *Environmental Research Letters*.
- East, J. D., E. Monier, R.K. Saari and F. Garcia-Menendez. Projecting changes in the frequency and magnitude of ozone pollution events under uncertain climate sensitivity. Under review in *Earth's Future*.
- Johnson, M. M. and F. Garcia-Menendez. Burning in your backyard? Connecting perceptions of wildland fire, smoke, and exposure mitigation actions. Under review in *Journal of Forestry*.
- Raab, H., J. Moyer, S. Afrin, F. Garcia-Menendez, and C. Ward-Caviness. Prescribed Fires, Smoke Exposure, and Hospital Utilization Among Heart Failure Patients. Under review *Environmental Health*.
- M. S. Sparks, I. Farahbakhsh, M. Anand, C. Bauch, K. C. Conlon, J. D. East, T. Li, M. Lickley, F. Garcia-Menendez, E. Monier, R. K. Saari. Interactions of short-term adaptation, long-term climate change mitigation, and climate variability in protecting human health from air pollution. Under review in *Proceedings of the National Academy of Sciences*.
- Yang, H., Q. Luo, H. Gang, J. Lin, J. Johnson, F. Garcia-Menendez, O. Deschenes, A. Mileva, and R. Deshmuk. Decarbonizing China's electricity sector brings significant health benefits but may widen regional disparities in employment. Under review *Nature Communications*.

Other Publications:

- Goldman, G., C. Ivey, F. Garcia-Menendez, and S. Balachandran (2021). Beyond the Lab: Early Career Researchers May Find Purpose through Policy, Advocacy, and Public Engagement. *Environmental Science & Technology*, 55 (5), 2720–2721, doi: 10.1021/acs.est.1c00495.
- East, J. and F. Garcia-Menendez (2020). Internal climate variability and initial condition ensembles in air quality projections. *Variations*, 18 (2), 11-17, doi:10.5065/0DSY-WH17.
- Garcia-Menendez, F., J. East, B. Pienkosz, and E. Monier (2020). Climate model response uncertainty in projections of climate change impacts on air quality. *Air Pollution Modeling and its Application XXVI*, Springer International Publishing, pp. 409-437, doi: 10.1007/978-3-030-22055-6.
- Call, D., F. Garcia-Menendez, J. Salam, and D. Tredwell (2019). Redesigning an engineering fundamentals course to increase student engagement and excitement about environmental engineering. *Proceedings of the 2019 ASEE Southeastern Section Conference*.

- Odman, M. T., Y. Hu, and F. Garcia-Menendez (2016). Atmospheric Plume Modeling with a Three-dimensional Refinement Adaptive Grid Method. *Air Pollution Modeling and its Application XXIV*, Springer International Publishing, pp. 409-413, doi: 10.1007/978-3-319-24478-5_67.
- Odman, M. T., A. Yano, F. Garcia-Menendez, Y. Hu, D. S. Mcrae, S. L. Goodrick, Y. Liu, and G. L. Achtemeier (2014). Development and evaluation of an air quality model for predicting the impacts of prescribed burns. *Air Pollution Modeling and its Application XXII*, Springer Publishing, pp. 517-521, doi: 10.1007/978-94-007-5577-2_87.
- Odman, M. T., Y. Hu, F. Garcia-Menendez, A. Yano-Davis, M. E. Chang, and A. G. Russell (2013). Fires and Air Quality Forecasts: Past, Present and Future. *EM Magazine*, November 2013, pp. 12-21.

TEACHING AND STUDENT MENTORING EXPERIENCE

Courses Taught:

CE 282: Hydraulics; *Spring '20, Spring '22, Spring '23*
 CE 373: Fundamentals of Env. Eng.; *Spring '16, Fall '16, Fall '17, Fall '18, Fall '20, Fall '21*
 CE 479/579: Air Quality; *Spring '17, Spring '18, Spring '20*
 CE 596: Environmental Modeling; *Fall '19, Spring '22*

Research Advising:

Graduate students: Amirhossein Ghajari, Ph.D., 2023- present
 Bianca Meotti, Ph.D., 2023- present
 Nafisa Islam, Ph.D., 2023- present
 Megan Johnson, Ph.D., 2017-2023 (*Postdoctoral Researcher at USFS*)
 James East, Ph.D., 2017-2022 (*Postdoctoral Researcher at Harvard*)
 Qian Luo, Ph.D., 2018-2022 (*Postdoctoral Researcher at Princeton*)
 Sadia Afrin, Ph.D., 2016-2021 (*Postdoctoral Researcher at MIT*)
 Shivani Patel, M. Eng. Mgmt., 2023
 Ahmad Amin, M. Env. Eng., 2022
 Caroline Harris, M. Env. Eng., 2021
 Hugh McTernan, M. Env. Eng., 2021
 Haofan Li, M. Civ. Eng., 2019-2021
 Lige Han, M. Env. Eng., 2020
 Muhundhan Mohan, M. Env. Eng., 2019-2020

Undergraduate Research: Meena Vazirani (Civ. Eng.); Grace Gould (Env. Eng.); Julia Mattox (Env. Eng.); Fiona Tennyson (Env. Eng., Univ. of Florida); Andrew Hardwick (Pol. Sci.); Emily Rudasill (Env. Eng.); Bret Pienkosz (Chem. Eng.)

High School Research: Phoebe Chen (NC School of Science and Mathematics); Katerina Peters (NC School of Science and Mathematics)

Graduate Committees: Ghazal Kamyabjou, Ph.D., current; Sailaja Eluri, Ph.D., current; Emily Floess, Ph.D., current; Stephanie Parsons, Ph.D., current; Ashley Bittner, Ph.D., 2023; Karen Ballesteros Ph.D. (Universidad de los Andes), 2021; Aditya Sinha, Ph.D., 2020; Maksimul Islam, Ph.D., 2020; Peilin Yang, M.S., 2018; Stephen Reece, M.S., 2017; Roshan Wathore, M.S., 2016

Graduate Student Awards and Honors (as research group members):

Association of Energy Engineers Scholarship, AEE (2022) – Qian Luo
1st Place Three Minute Thesis competition, NCSU CCEE Department (2020) – James East
Graduate Research Innovation Award, Joint Fire Science Program (2021) – Megan Johnson
Air Pollution Control and Waste Minimization Scholarship, A&WMA (2021) – Qian Luo
Sustainability Research and Study Scholarship, A&WMA (2021) – Haofan Li
Science to Action Fellowship, U.S. Geological Survey (2021) – Megan Johnson
Energy Data Analytics Fellowship, Duke University Energy Initiative (2021) – Qian Luo
Outstanding Student Presentation Award, AGU Fall Meeting (2020) – Megan Johnson
Selected Participant: CEE Rising Stars, Carnegie Mellon University (2020) – Sadia Afrin
International Smoke Symposium Scholarship, IAWF (2020) – Sadia Afrin
2nd Place Three Minute Thesis competition, NCSU CCEE Department (2020) – Sadia Afrin
Global Change Fellowship, Southeast Climate Adaptation Science Center (2020) –
Megan Johnson
Selected Participant: AGU Voices for Science program (2020) – Megan Johnson
Selected Participant: ORISE Research Programs, US EPA (2020) - James East
Graduate Student Association Travel Assistance Award, NCSU (2019) – Sadia Afrin
Graduate Research Innovation Award, Joint Fire Science Program (2019) – Sadia Afrin
Selected Participant: NSF INTERN program (2019) – Sadia Afrin
Global Change Fellowship, Southeast Climate Adaptation Science Center (2019) – Haofan Li
Graduate Student Workshop Support Grant, NCSU (2019) - James East
Sustainability Research and Study Scholarship, A&WMA (2019) - James East
Best Poster, NC BREATHE Conference (2019) – Megan Johnson
Graduate Student Association Travel Assistance Award, NCSU (2018) - Megan Johnson
Selected Participant: NCAR ACOM Atmospheric Chemistry and Aerosol Modeling
Workshop (2018) – Megan Johnson
1st Place Best M.S. Student Poster, A&WMA Annual Conference (2018) – James East
Selected Participant: ComSciCon-Triangle (2018) – Megan Johnson
Student Poster Competition Winner, AAAR Annual Conference (2017) – Sadia Afrin

Other Activities:

Future Ingenieros @ NC State Program Founder and Lead (2018-present)
Academic advisor for ~15 B.S. students per year
A&WMA Student Chapter at NC State Faculty Adviser (2021-present)
Juntos Summer Academy Planning Committee (2018)
Critical Path Course Redesign Grant, *NC State University*, (2017-2018)
Kaufman Teaching Certificate, *MIT Teaching and Learning Laboratory* (2014)

SCIENTIFIC PRESENTATIONS

Invited Seminars and Talks:

- “Wildland fire, air quality, and public health in the Southeastern U.S.” University of North Carolina Asheville, Department of Atmospheric Sciences, online, April 17, 2023
- “Integrating air pollution impacts into power sector operations and decarbonization efforts in the U.S. and China”, University of North Carolina at Chapel Hill, Department of Environmental Sciences and Engineering, Chapel Hill, NC, January 23, 2023
- “Perspectives on Climate Risk in Natural-Human Systems”, NC State University Student Energy Club, Raleigh, NC, April 15, 2022 (panel)
- “Fire and the Wildland Urban Interface in the eastern U.S.”, USDA Forest Service, Fueling Collaboration Panel Discussion Series, online, February 17, 2022 (panel)
- “Potential Impacts of Prescribed Fire Smoke on Air Quality, Public Health, and Socially Vulnerable Populations in the Southeastern U.S.”, Southern Fire Exchange, online, August 12, 2021 (webinar)
- “Wildland fire, air quality, and public health in the Southeastern U.S.”, University of Alaska Anchorage, Foundations for Improving Resilience in the Energy Sector Against Wildfires on Alaskan Lands (FIREWALL) group, online, July 21, 2021
- “Wildland fire, air quality, and public health in the Southeastern U.S.”, University of Central Florida, Department of Civil, Environmental and Construction Engineering, online, October 10, 2020
- “Evaluating the air quality benefits and trade-offs of prescribed fire”, U.S. Environmental Protection Agency, Wildland Fire Research Focus Group, online, June 22, 2021 (webinar)
- “Wildland fire, air quality, and public health in the Southeastern U.S.”, University of Central Florida, Department of Civil, Environmental, and Construction Engineering, online, October 8, 2020
- “Internal climate variability and initial condition ensembles in air quality projections”, U.S. Climate Variability and Predictability Program, online, September 8, 2020 (webinar)
- “Computational modeling to understand air pollution and inform environmental policy”, University of Texas at San Antonio, Department of Civil and Environmental Engineering, San Antonio, TX, February 10, 2020
- “Fire management under climate change: a panel discussion on fire and its effects on human and ecological communities in a changing world”, Southeast Climate Adaptation Science Center, North Carolina State University, Raleigh, NC, October 11, 2018
- “An integrated prescribed fire – air quality information system”, Southern Fire Exchange, online October 5, 2018 (webinar)
- “Modeling air quality under global change”, Jordan Science Speaker Series, Charles E. Jordan High School, Durham, NC, January 11, 2018
- “A unified prescribed fire record for the South”, Southern Integrated Prescribed Fire Information System (SIPFIS) Workshop, Georgia Institute of Technology, Atlanta, GA, August 8, 2017
- “Impacts of climate change and policy on U.S. air quality and health: An uncertainty analysis” U.S. Environmental Protection Agency, Energy and Climate Assessment Team, Durham, NC, December 15, 2016

- “Climate change and health impacts from air pollution” U.S. Environmental Protection Agency, Climate Change Division, online, July 25, 2016 (webinar)
- “Impacts of climate change and climate policy on U.S. air quality and health” 3rd Latin American Research Symposium, North Carolina State Latin American Student Association, Raleigh, NC, February 19, 2016
- “Climate change impacts on U.S. air quality (part 1 and 2)” La Salle University - Colombia, Department of Environmental and Sanitary Engineering, Bogotá, Colombia, November 19 and 26, 2015
- “Modeling air pollution at vastly different scales: from fire plumes to climate change” North Carolina State University, Department of Civil, Construction, and Environmental Engineering, Raleigh, NC, April 13, 2015
- “Modeling air pollution at vastly different scales: from fire plumes to climate change” Case Western Reserve University, Department of Chemical and Biomolecular Engineering, Cleveland, OH, April 8, 2015
- “Modeling air pollution at vastly different scales: from fire plumes to climate change” University of Virginia, Department of Civil and Environmental Engineering, Charlottesville, VA, March 25, 2015
- “Modeling air pollution at vastly different scales: from fire plumes to climate change” University of Illinois at Urbana-Champaign, Department of Civil and Environmental Engineering, Urbana, IL, March 16, 2015
- “Modeling air pollution at vastly different scales: from atmospheric plumes to climate change” University of Iowa, Department of Chemical and Biochemical Engineering, Iowa City, IA, January 22, 2015
- “Simulating the impact of fires on air quality with regional-scale chemical transport models” Massachusetts Institute of Technology, Joint Program on Global Change, Cambridge, MA, May 10, 2013
- “High resolution atmospheric plume simulations with regional-scale air quality models” Harvard University, School of Engineering and Applied Sciences, Cambridge, MA, February 6, 2013

Conference Presentations (as presenter):

- “Land management and air pollution impacts from wildland fires in the Southeastern U.S. under a changing climate”, Association of Environmental Engineering and Science Professors (AEESP) Conference, Boston, MA, June 21, 2023
- “Projections of land management and air pollution from wildland fires under climate change in the Southeastern U.S.”, International Technical Meeting on Air Pollution Modelling and its Application, platform, Chapel Hill, NC, May 21, 2023
- “Deforestation, forest fires, climate change, and air quality” (invited), IX Colombian Congress and International Conference on Air Quality and Public Health, Santa Marta, Colombia, March 24, 2023
- “Impacts of Accelerating Decarbonization in China on the Country’s Power System and Public Health”, American Geophysical Union Fall Meeting, Chicago, IL, December 15, 2022
- “Computational Modeling to Guide Climate Impacts Research and Effective Environmental Policy”, U.S.-Africa Frontiers of Science, Engineering, and Medicine Symposium, Nairobi, Kenya, October 12, 2022

- “Social disparities in exposure to Smoke from Wildland Fire and Land Management”, American Meteorological Society Annual Meeting, Online, July 27, 2022
- “Critical Review Discussion: Air Quality Tradeoffs of Wildfire and Prescribed Burns” (invited), Air and Waste Management Association Annual Conference, Online, July 2, 2020
- “Assessing climate variability and change in an ensemble simulation of climate impacts on U.S. air quality and public health” (invited), American Meteorological Society Annual Meeting, Boston, MA, January 13, 2020
- “Wildland fire, air quality, and public health in the Southeastern U.S.” (invited), VII Colombian Congress and International Conference on Air Quality and Public Health, Barranquilla, Colombia, August 15, 2019
- “Internal variability in projections of climate change impacts on air quality and health”, NCAR Large Ensembles Workshop, Boulder, CO, July 26, 2019
- “Connections between prescribed fire, air quality, and communities in the Southeastern U.S.”, Air and Waste Management Association Annual Conference, Quebec, Canada, June 26, 2019
- “Uncertainty in integrated projections of climate change impacts on air quality, public health, and policy benefits” (invited), American Geophysical Union Fall Meeting, Washington, DC, December 10, 2018
- “Computational modeling to guide air quality research and environmental policy”, Arab-American Frontiers of Science, Engineering, and Medicine Symposium, Kuwait City, November 4, 2018
- “Fostering Student Engagement in a Large Class using TopHat”, UNC CAUSE Conference, Greenville, NC, October 3, 2018
- “Climate model response uncertainty in projections of climate change impacts on air quality”, International Technical Meeting on Air Pollution Modelling and its Application, Ottawa, Canada, May 15, 2018
- “Assessing the Impact of Fires on Air Quality in the Southeastern U.S. with a Unified Prescribed Burning Database”, American Geophysical Union Fall Meeting, New Orleans, LA, December 14, 2017
- “A unified prescribed fire database for the Southern United States”, Annual Community Modeling and Analysis System (CMAS) Conference, Chapel Hill, NC, October 23, 2017
- “Assessing key uncertainties in projections of climate change impacts on air quality”, Air and Waste Management Association Annual Conference, Pittsburgh, PA, June 7, 2017
- “Integrated projections of U.S. air quality benefits from avoided climate change”, Annual Community Modeling and Analysis System (CMAS) Conference, Chapel Hill, NC, October 6, 2015
- “Impacts of climate change and policy on U.S. air quality and health: an uncertainty analysis”, Association of Environmental Engineering & Science Professors (AEESP) Conference, New Haven, CT, June 16, 2015
- “Evaluating the contribution of natural variability and climate model response to uncertainty in projections of climate change impacts on U.S. air quality”, American Geophysical Union Fall Meeting, San Francisco, CA, December 18, 2014
- “Evaluating the role of natural variability in assessments of climate change impacts on air quality”, American Institute of Chemical Engineers Annual Meeting, Atlanta, GA, November 17, 2014

- “Climate change, air quality and public health: an uncertainty analysis”, American Institute of Chemical Engineers Annual Meeting, Atlanta, GA, November 16, 2014
- “Evaluating the role of climate uncertainty in assessments of climate change impacts on air quality”, Annual Community Modeling and Analysis System (CMAS) Conference, Chapel Hill, NC, October 28, 2014
- “A three-dimensional refinement adaptive grid algorithm for Eulerian air quality models”, Annual Community Modeling and Analysis System (CMAS) Conference, Chapel Hill, NC, October 27, 2014
- “Climate change impacts on air quality in the U.S.: An uncertainty analysis” Community Earth System Model Chemistry-Climate Working Group Meeting, Boulder, CO, February 10, 2014
- “High-resolution three-dimensional modeling with an adaptive grid regional-scale air quality model” American Geophysical Union Fall Meeting, San Francisco, CA, December 7, 2012
- “High-resolution three-dimensional plume modeling with CMAQ” Annual Community Modeling and Analysis System (CMAS) Conference, Chapel Hill, NC, October 15, 2012
- “Sensitivity analysis of model-related inputs in wildland fire simulations using CMAQ” Air and Waste Management Association Annual Conference, San Antonio, TX, June 21, 2012
- “Improved modeling of wildland fire plumes with CMAQ” American Meteorological Society Annual Meeting, New Orleans, LA, January 26, 2012
- “Sensitivity of air quality to meteorological inputs in forest fire simulations” American Meteorological Society Annual Meeting, New Orleans, LA, January 26, 2012
- “Modeling the air quality impacts of wildfires with CMAQ” Annual Community Modeling and Analysis System (CMAS) Conference, Chapel Hill, NC, October 26, 2011
- “Analysis of vertical fire emissions distribution in CMAQ” Annual Community Modeling and Analysis System Conference, Chapel Hill, NC, October 25, 2011
- “Evaluation of air quality models applied to wildland fire impact simulation” Annual Community Modeling and Analysis System (CMAS) Conference, Chapel Hill, NC, October 12, 2010
- “An Adaptive Grid Version of CMAQ for Improving the Resolution of Plumes” Georgia Tech Research and Innovation Conference, Atlanta, GA, February 8, 2010
- “Improved air quality modeling for predicting the impacts of controlled forest fires” Invited presentation at Georgia Chapter of the Air and Waste Management Association Fall Conference, Atlanta, GA, October 8, 2009

PROFESSIONAL ACTIVITIES, MEMBERSHIPS AND SERVICE

Grant proposal reviewer:

- Canada Foundation for Innovation
- Chile National Fund for Scientific and Technological Development (FONDECYT)
- National Institute for Standards and Technology/National Science Foundation- Disaster Resilience Research Grants
- National Oceanic & Atmospheric Administration
- National Science Foundation - Arctic Sciences
- National Science Foundation - Computational and Data-Enabled Science and Engineering
- National Science Foundation - Decision, Risk and Management Sciences

National Science Foundation – Environmental Engineering
National Science Foundation – Environmental Sustainability
National Science Foundation – Fluid Dynamics
Joint Fire Science Program (DOI/USDA)
US Environmental Protection Agency

Journal reviewer:

Aerosol and Air Quality Research; Atmosphere; Atmospheric Chemistry and Physics;
Atmospheric Environment; Atmospheric Pollution Research; Climate Policy; Environment
International; Environmental Justice; Environmental Research Letters; Environmental Science
& Technology; Environmental Science & Technology Letters; Earth's Future; Geohealth;
Geophysical Research Letters; Geoscientific Model Development; International Journal of
Disaster Risk Reduction; International Journal of Environmental Research and Public Health;
International Journal of Sustainable Transportation; International Journal of Wildland Fire;
Journal of Environmental Protection; Journal of Exposure Science and Environmental
Epidemiology; Journal of Geophysical Research – Atmospheres; Journal of the Air & Waste
Management Association; PLOS ONE; Science of the Total Environment; Scientific Reports;
Sustainability; The Lancet Planetary Health; Transportation Research Part D

Professional society memberships:

Air & Waste Management Association
American Geophysical Union
American Meteorological Society
Association of Environmental Engineering and Science Professors

Other Activities:

Founder and leader: Future Ingenieros @ NC State Program (2018-present)
Faculty advisor: Air & Waste Management Association Student Chapter (2021-Present)
CCEE Department Publicity and Communications Committee Member (2017-present)
CCEE Department Diversity, Equity, and Inclusion Committee Member (2016-present)
Environmental, Water Resources, and Coastal Engineering Graduate Research Symposium
Organizing Committee (2022, 2023)
Environmental, Water Resources, & Coastal Engineering Seminar Series Coordinator (2023-
Present)
Juntos Summer Academy Planning Committee Member (2018)
CCEE Department Seminars and Symposia Committee Member (2016-2017)