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# FERNANDO GARCIA MENENDEZ

## Associate Professor

Department of Civil, Construction  
and Environmental Engineering  
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

## ADDITIONAL APPOINTMENTS

- 2023 – **Center for Geospatial Analytics, Raleigh, NC**  
Faculty Fellow
- 2018- **Southeast Climate Adaptation Science Center, Raleigh, NC**  
Faculty Affiliate

## HONORS AND AWARDS

- Fulbright Canada Distinguished Chair in Environmental Science, Foundation for Educational Exchange between Canada and the United States of America (2024-25)
- Invited Participant: U.S.-Africa Frontiers Symposium, National Academies, African Academy of Sciences (2022)
- George H. Blesis Outstanding Undergraduate Advisor Award, NCSU (2021)
- Gertrude Cox Award for Innovative Excellence in Teaching and Learning with Technology, NSCU (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:**

- “Air pollution from wildfires in Canada: Assessing the impacts and exploring solutions”;  
Foundation for Educational Exchange between Canada and the United States of America:  
8/2024 - 4/2025, \$50,000
- “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:**

East, J. D., E. Monier, R.K. Saari and F. Garcia-Menendez (2024). Projecting changes in the frequency and magnitude of ozone pollution events under uncertain climate sensitivity. *Earth's Future* (in press).

Yang, H., Q. Luo, G. He, J. Lin, J. Johnson, F. Garcia-Menendez, O. Deschenes; A. Mileva; R. Deshmukh (2024). Regional disparities in health and employment outcomes of China's transition to a low-carbon electricity system. *Environmental Research: Energy*, 1 (2), 025001, doi: 10.1088/2753-3751/ad3bb8.

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. Health and equity implications of individual adaptation to air pollution in a changing climate (2024). *Proceedings of the National Academy of Sciences*. 121 (5) e2215685121, doi: 10.1073/pnas.2215685121.

Raab, H., J. Moyer, S. Afrin, F. Garcia-Menendez, and C. Ward-Caviness (2023). Prescribed fires, smoke Exposure, and hospital utilization among heart failure patients. *Environmental Health*, 22 (86), doi: <https://doi.org/10.1186/s12940-023-01032-4>.

- Luo, Q., F. Garcia-Menendez, J. Lin, G. He, J. X. Johnson (2023). Accelerating China's power sector decarbonization can save lives: integrating public health goals into power sector decisions. *Environmental Research Letters*, 18 (10), 104023, doi: 10.1088/1748-9326/acf84b.
- 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 NOx 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*, 1, 025009, 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.

#### **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 Environmental Engineering; *Spring '16, Fall '16, Fall '17, Fall '18, Fall '20, Fall '21, Fall '22, Fall '23*  
 CE 479/579: Air Quality; *Spring '17, Spring '18, Spring '20, Spring '24*  
 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):**

Honorable Mention - Paul v. Roberts Outstanding Doctoral Dissertation Award, AEESP (2024) - Qian Luo  
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 teaching and mentoring 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)
- 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:**

- “Integrating air pollution impacts into power sector operations and decarbonization efforts”, University of Arizona, Department of Chemical and Environmental Engineering, Tucson, AZ, March 11, 2024
- “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):**

- “Integrated assessment of the environmental and human health impacts of wildland fires”, U.S.-Africa Frontiers of Science, Engineering, and Medicine Symposium, poster, Rabat, Morocco, January 16, 2024

- “Integrated Energy and Environmental Modeling to Assess the Costs and Benefits of Decarbonization Pathways”, Arab-American Frontiers of Science, Engineering, and Medicine Symposium, poster, Doha, Qatar, October 23, 2023
- “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**

### **Service activities:**

- Future Ingenieros @ NC State: Program founder and leader (2018-present)
- CCEE Department Diversity, Equity, and Inclusion Committee: Chair (2023-present); Member (2016-2023)
- Air & Waste Management Association 2025 Annual Conference and Exposition: Technical Program Vice-Chair (2024-present)
- Air & Waste Management Association Student Chapter: Faculty advisor (2021-present)
- NC State Environmental, Water Resources, and Coastal Engineering Research Symposium: Faculty lead (2023); Committee member (2022)
- NC State Environmental, Water Resources, and Coastal Engineering Seminar Series: Coordinator (2023-2024)
- Community Modeling and Analysis System (CMAS) Conference: Session chair (2023)
- CCEE Department Publicity and Communications Committee: Member (2017-2023)
- American Geophysical Union Fall Meeting: Session convener (2019)
- Juntos Summer Academy Planning Committee Member (2018)
- CCEE Department Seminars and Symposia Committee Member (2016-2017)
- Southern Integrated Prescribed Fire Workshop for Land Mangers: Organizer (2017)

### **Grant proposal reviewer:**

Canada Foundation for Innovation

Chile National Fund for Scientific and Technological Development (FONDECYT)

National Academies of Sciences, Engineering, and Medicine

National Institute for Standards and Technology

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
Communications Earth & Environment	Environment International
Environmental Justice	Environmental Research Letters
Environmental Science & Technology Letters	Environmental Science & Technology
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	
Nature Cities	PLOS ONE
Science of the Total Environment	Scientific Reports
Sustainable Development	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