James D. East

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EDUCATION

Ph.D., Environmental Engineering — May 2023 (passed defense November 2022)
Understanding Multiscale Air Quality Impacts of Observed and Projected Emissions Changes using Chemical Transport Models.
Advisor: Dr. Fernando Garcia Menendez
North Carolina State University, Raleigh, NC

M.ENE., Master of Environmental Engineering — December 2019
North Carolina State University, Raleigh, NC

B.S., Environmental Engineering, *summa cum laude* — May 2015
North Carolina State University, Raleigh, NC

EXPERIENCE

Postdoctoral Fellow — Harvard University
February 2023 - Cambridge, MA
PI: Dr. Daniel Jacob

ORISE Research Fellow — U.S. Environmental Protection Agency
January 2020 - January 2023 — Research Triangle Park, NC
Project title: Integrating Chemical Data Assimilation into the Community Multiscale Air Quality Modeling System.
Research mentor: Dr. Barron H. Henderson

Graduate Research Assistant — NC State University
August 2017 - January 2020 — Raleigh, NC
Advised by Dr. Fernando Garcia Menendez in the Department of Civil, Construction, and Environmental Engineering.

Designer I — John R. McAdams Company
2015 - 2017 — Durham, NC
Stormwater design engineer. EIT certification.

Undergraduate Research Assistant — NC State University
2014-2015 — Raleigh, NC
Advised by Dr. Emily Berglund

REFEREED PUBLICATIONS

James D. East, Erwan Monier, and Fernando Garcia-Menendez. Characterizing and quantifying uncertainty in projections of climate change impacts on air quality. *Environmental Research Letters*, 17(9), 2022. URL: https://doi.org/10.1088/1748-9326/ac8d17

James D. East, B. H. Henderson, S. L. Napelenok, S. N. Koplitz, G. Sarwar, R. Gilliam, A. Lenzen, D. Q. Tong, R. B. Pierce, and F. Garcia-Menendez. Inferring and evaluating satellite-based constraints on no_x emissions estimates in air quality simulations. *Atmospheric Chemistry and Physics*, 22(24):15981–16001, 2022. URL: https://acp.copernicus.org/articles/22/15981/2022/

Daiwen Kang, Christian Hogrefe, Golam Sarwar, **East, James D.**, J. Mike Madden, Rohit Mathur, and Barron H. Henderson. Assessing the impact of lightning nox emissions in cmaq using lightning flash data from wwlln over the contiguous united states. *Atmosphere*, 13(8), 2022. URL: https://www.mdpi.com/2073-4433/13/8/1248

James D. East, Juan Sebastian Montealegre, Jorge E. Pachon, and Fernando Garcia-Menendez. Air quality modeling to inform pollution mitigation strategies in a latin american megacity. *Science of The Total Environment*, 776(145894), 2021. URL: https://doi.org/10.1016/j.scitotenv.2021.145894

OTHER PUBLICATIONS

James D. East and Fernando Garcia-Menendez. *Internal climate variability and initial condition ensembles in air quality projections*. In: C. Deser and K. Rodgers (guest eds) New research on climate variability and change using initial-condition Large Ensembles. Special issue of US CLIVAR VARIATIONS. Volume 18, Number 2, Summer 2020. URL: `http://dx.doi.org/10.5065/0DSY-WH17`

Fernando Garcia-Menendez, **East, James D.**, Bret D. Pienkosz, and Erwan Monier. Climate model response uncertainty in projections of climate change impacts on air quality. In Clemens Mensink, Wanmin Gong, and Amir Hakami, editors, *Air Pollution Modeling and its Application XXVI*, pages 433–437. Springer International Publishing, 2020. URL: `https://doi.org/10.1007/978-3-030-22055-6_69`

Juan S. Montealegre, Johan Vanegas, Jorge E. Pachon, Aura Rojas, **East, James D.**, and Fernando Garcia-Menendez. Air quality modeling as a tool for adjusting emission inventories. In *2019 Congreso Colombiano y Conferencia Internacional de Calidad de Aire y Salud Pública (CASP)*, pages 1–4, 2019. URL: `https://doi.org/10.1109/CASAP48673.2019.9364063`

INVITED PRESENTATIONS

2023 East, J.D. et al., Understanding Lightning-NOx Emissions and their Air Quality Impacts Using Data Assimilation of TROPOMI NO_2. AGU Atmospheric and Space Electricity Early Career seminar. June 8, 2023.

SCIENTIFIC PRESENTATIONS

2023 East, J.D. et al., HTAPv3 Initial Application in Hemispheric CMAQ. Task Force on Hemispheric Transport of Air Pollution Meeting, April 21, 2023.

2023 East, J.D. et al., Inferring and evaluating satellite-based constraints on NOx emissions estimates in air quality simulations. NASA Atmospheric Chemistry and Dynamics Lab Seminar. January 5, 2023.

2022 East, J.D. et al., Lightning-NOx Emissions, Impacts, and Evaluation Using Satellite Data Assimilation and Remote Observations. AE13A-08. AGU Fall Meeting, Chicago, IL. December 13, 2022.

2022 Sparks et al., Effect of natural variability in mediating short term adaptation to air pollution. GC26A-03. AGU Fall Meeting, December 12, 2022.

2022 East, J.D.. Using satellites to better understanding our air. NC State University Three Minute Thesis Competition. October 25, 2022.

2022 East, J.D. et al., Applying satellite data assimilation to infer lightining-NOx emissions in CMAQ. CMAS Conference, Chapel Hill, NC. October 18, 2022.

2022 Madden et al., Evaluating methods of representing lightning NOx emissions across the Northern Hemisphere. 21st Annual CMAS Conference, Chapel Hill, NC. October 18, 2022.

2022 East, J.D. et al., Advancing the use of satellite NO_2 data in the CMAQ modeling platform: framework, emissions estimates, and evaluation. Air Quality Assessment Division Technical Discussion, U.S. EPA. May 20, 2022.

2022 East, J.D.. Using satellites to better understanding our air. Three Minute Thesis Competition, Department of Civil, Construction, and Environmental Engineering. April 18, 2022.

2022 East, J.D. et al., Inferring air pollutant emissions using satellites. Environmental, Water Resources, and Coastal Engineering Symposium at NC State. March 4, 2022.

2022 East, J.D. et al., Applying OMI and TROPOMI NO_2 observations in EPA's CMAQ modeling framework. HAQAST Update22. January 20, 2022.

2022 East, J.D. et al., Comparing OMI and TROPOMI NO_2 data assimilation for estimating NOx emissions. Air Quality Model Applications Group, Research Triangle Park, NC. January 5, 2022.

2021. East, J.D., et al., Enhanced representation of inter-continental pollutant transport by assimilating satellite NO_2 and performing NOx emissions inversions. CMAS Meeting. November 2, 2021.

2021 Madden, et al., Assessment of the Impact of Lightning NOx on Air Quality over the Northern Hemisphere. CMAS Meeting. November 2, 2021.

2021 East, J.D., et al., Using Satellites to better understand our air. Science on Earth Day "ScED" Talks, U.S. EPA Office of Research and Development. April 22, 2021.

2021 East, J.D. et al., Early Career Seminar. National Leadership Training Organization, U.S. EPA. March 25, 2021.

2020 East, J.D. et al., Implementing satellite NO_2 data assimilation in CMAQ for identifying emissions biases and improving regional boundary conditions. Atmospheric and Environmental Systems Modeling Division Seminar, U.S. EPA. November 18, 2020.

2020 East, J.D. et al., Implementing satellite NO_2 data assimilation in CMAQ for identifying emissions biases and improving regional boundary conditions. CMAS Conference, Chapel Hill, NC. October 27, 2020.

2020 East, J.D., et al., Presentation to the Division Director on implementing chemical data assimilation into the CMAQ model. Air Quality Assessment Division, U.S. EPA. September 11, 2020.

2020 Garcia Menendez, F., et al., Assessing Climate Variability and Change in an Ensemble Simulation of Climate Impacts on U.S. Air Quality and Public Health (Invited). AMS Annual Meeting. January 13, 2020.

2019 East, J.D. et al., Particulate matter sensitivity to local emissions and meteorology over a Latin American megacity for source apportionment and uncertainty analysis. CMAS Conference. October 21, 2019.

2019 East, J.D. et al., A source-scaling method for PM source apportionment in CMAQ simulations of Bogotá air quality. CASAP Conference. Barranquilla, Colombia. August 14, 2019.

2019 East, J.D.. Sensitivity of particulate matter pollution to emissions sector changes in a Latin American Megacity. NC Breathe Conference. Wilmington, NC. April 11, 2019.

2018 Garcia Menendez, F., et al., Uncertainty in integrated projections of climate change impacts on air quality, public health, and policy benefits (Invited). AGU Fall Meeting. December 13, 2018.

2018 East, J.D. Difficulties and successes using Henry2 to compile and benchmark CMAQ, a community air quality model. NC State University High Performance Computing Research Symposium. November 20, 2018.

POSTER PRESENTATIONS

2022 East, J.D. et al., Projecting Climate-Driven Changes in Extreme Ozone Pollution under Natural Variability and Uncertain Climate Sensitivity. A52N-1166. AGU Fall Meeting, December 16, 2022.

2022 East, J.D. et al., Assimilation of NO_2 - A comparison of multiple products and multiple models. Poster at the International GEOS-Chem Conference. June 8, 2022.

2022 East, J.D. et al., Assimilation of NO_2 - A comparison of multiple products and multiple models. Poster at the TEMPO Science Team Meeting. June 1, 2022.

2021 East, J.D. et al., Comparing OMI and TROPOMI NO_2 Data Assimilation for Estimating NOx Emissions. AGU Fall Meeting. December 13, 2021.

2021 Madden, M. et al., Comprehensive Evaluation of Hemispheric CMAQ Lightning NOx Simulations. AGU Fall Meeting. December 13, 2021.

2021 East, J.D. et al., Assimilating satellite observations of NO_2 pollution in an air quality model to identify emissions biases NC State University Environment, Water Resources, and Coastal Engineering Annual Research Symposium. February 26, 2021.

2020 East, J.D. et al., Impact of climate related uncertainty on projections of US air quality and implications for extremes. AGU Fall Meeting. December 10, 2020.

2020 East, J.D. et al., Impact of climate uncertainty on projections of $PM_{2.5}$ pollution over the US. AAAR Conference. October 5, 2020.

2020 East, J.D. et al., Implementing satellite data assimilation capabilities in the EPA hemispheric modeling platform for improving boundary conditions. HAQAST Showcase. July 21, 2020.

2020 East, J.D., and Garcia-Menendez, F. Impact of climate sensitivity on projections of US air quality and extreme air pollution. NC State University Environment, Water Resources, and Coastal Engineering Annual Research Symposium. March 6, 2020.

2019 East, J.D., and Garcia-Menendez, F. Sensitivity of particulate matter pollution to emissions sector changes in a Latin American Megacity. NC State University Environment, Water Resources, and Coastal Engineering Annual Research Symposium. March 1, 2019.

2019 East, J.D.. Integrating Speciated Particulate Matter Data to Improve Model Performance in Bogota. NC State University Latin American Research Symposium. February 15, 2019.

2018 East, J.D. et al., Integrating Speciated Particulate Matter Data to Improve Model Performance in Bogota. 17th Annual CMAS Conference. October 22, 2018.

2018 East, J.D., and Garcia-Menendez, F. Impact of Climate Sensitivity Uncertainty on US Air Quality Projections. 111th Air & Waste Management Association Annual Conference & Exhibition. June 25, 2018.

2018 East, J.D., and Garcia-Menendez, F. Impact of Climate Model Response on Projections of Future Air Quality under various Climate Scenarios. NC State University Environment, Water Resources, and Coastal Engineering Annual Research Symposium. March 2, 2018.

2015 East, J.D., and Berglund, E. Agent Based Modeling to Simulate Water Use Adaptations on the Upper Neuse River Basin. 108th Air & Waste Management Association Annual Conference & Exhibition. June 22, 2015.

TECHNICAL SKILLS

Languages: Python (advanced), NCL (intermediate), MATLAB (intermediate), Shell scripting (advanced), LaTeX, FORTRAN (intermediate)
Air quality modeling tools: Experience using satellite observation data from OMI and TROPOMI satellites. CMAQ, WRF, GSI, NetCDF, IOAPI, NCO.

TEACHING & MENTORING

Lecture and hands-on activity. CE596 Environmental Modeling. March 2, 2022. Developed and led class Python coding activity and delivered lecture.

Undergrad research advisor. Summer 2021. Trained an undergraduate researcher in conducting atmospheric modeling research.

Teaching Assistant. CE373 Fundamentals of Environmental Engineering. Spring 2018.

Guest instructor. Boy Scouts Merit Badge College event at NC State University. Spring 2018. Led class in presentation about contemporary issues in air pollution.

AWARDS AND FELLOWSHIP

Fellowship: *(declined)* NASA Postdoctoral Program, Jet Propulsion Laboratory. 2023.

Finalist: Three Minute Thesis Competition. North Carolina State University. 2022.

1st Place: Three Minute Thesis Competition. Department of Civil, Construction, and Environmental Engineering at North Carolina State University. 2022.

Fellowship: U.S. Environmental Protection Agency ORISE Fellowship. 2020-2023

Scholarship: Sustainability Research and Study Related to Air Quality and Waste Management, 2019, presented by Air & Waste Management Association

Travel Award: NC State Graduate School competitive workshop funding for travel to NCAR WRF Training, Boulder, CO, Summer 2019

1st Place: Masters student poster competition, 2018 AWMA ACE, Hartford, CT

Honorable Mention: Poster competition, 2018 Environmental, Water Resources, and Coastal Engineering Annual Symposium, NC State University, Raleigh, NC

Graduate Merit Award: 2017, NC State University

1st Place: Undergrad student poster competition, 2015 AWMA ACE, Raleigh, NC

SERVICE

Peer-review: *Environmental Pollution*

A&WMA Student Chapter: NC State University. Secretary, 2019-2020. President, 2018-2019

Race Director: Hope Through Education 5K, Raleigh, NC. December 2018, November 2019. Planned and directed the event which raised over $10,000 for student scholarships and had over 150 participants. `hopethroughed5k.com`.

Mentor: Ligon Adoption Mentorship Program (LAMP), Raleigh, NC 2016-2018

Cross Country & Track Club at NC State: Vice-President, 2013-2014.

PROFESSIONAL MEMBERSHIPS

American Geophysical Union
Air & Waste Management Association – Member, RTP Chapter
Tau Beta Pi
N.C. Engineering Intern Certification A-28871 – Environmental Engineering

TRAINING

WRF Tutorial. NCAR Campus, Boulder, CO. July 15-19, 2019.
Introduction to HPC at NC State. NC State University, Raleigh, NC. October 4, 2018.
BenMAP-CE Training. U.S. EPA Campus. Research Triangle Park, NC. September 25-27, 2018.