

# James D. East, Ph.D.

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<https://eastjames.github.io>

Education	<b>Ph.D.</b> , Environmental Engineering North Carolina State University, Raleigh, NC <i>Dissertation: Understanding Multiscale Air Quality Impacts of Observed and Projected Emissions Changes using Chemical Transport Models.</i> <i>Faculty Advisor:</i> Fernando Garcia Menendez, Associate Professor	2022
	<b>B.S.</b> , Environmental Engineering North Carolina State University, Raleigh, NC	2015
Experience	<b>Postdoctoral Fellow</b> 2023 - School of Engineering and Applied Sciences <i>Faculty Mentor:</i> Daniel Jacob, Professor	Harvard University Cambridge, MA
	<b>ORISE Research Fellow</b> 2020 - 2023 Office of Research and Development <i>Mentor:</i> Barron H. Henderson	U.S. Environmental Protection Agency Research Triangle Park, NC
	<b>Graduate Research Assistant</b> 2017 - 2020 Department of Civil, Construction, and Environmental Engineering <i>Faculty Advisor:</i> Fernando Garcia Menendez, Associate Professor	NC State University Raleigh, NC
	<b>Designer I</b> 2015 - 2017 Design engineer	John R. McAdams Company Durham, NC
	<b>Undergraduate Research Assistant</b> 2014-2015 Department of Civil, Construction, and Environmental Engineering <i>Faculty Advisor:</i> Emily Berglund, Professor	NC State University Raleigh, NC
Manuscripts in Review	<b>James D. East</b> , Daniel J. Jacob, Nicholas Balasus, A. Anthony Bloom, Lori P. Bruhwiler, Zichong Chen, Jed O. Kaplan, Loretta J. Mickley, Todd A. Mooring, Elise Penn, Benjamin Poulter, Melissa Payer Sulprizio, Robert M. Yantosca, John R. Worden, and Zhen Zhang. Interpreting the seasonality of atmospheric methane [ <i>ESS Open Archive</i> preprint]. Under review in <i>Geophysical Research Letters</i> , 2024. URL: <a href="https://doi.org/10.22541/essoar.170688829.91686313/v1">https://doi.org/10.22541/essoar.170688829.91686313/v1</a>	
	<b>James D. East</b> , Monier E, Saari RK, and Garcia-Menendez F. Projecting changes in the frequency and magnitude of ozone pollution events under uncertain climate sensitivity. Under review in <i>Earth's Future</i>	
Selected Publications	Matt S. Sparks, I Farahbakhsh, M Anand, CT Bauch, KC Conlon, <b>JD East</b> , T Li, M Lickley, F Garcia-Menendez, E Monier, and RK Saari. Health and equity implications of individual adaptation to air pollution in a changing climate. <i>Proceedings of the National Academy of Sciences</i> , 121(5):e2215685121, January 2024. URL: <a href="https://doi.org/10.1073/pnas.2215685121">https://doi.org/10.1073/pnas.2215685121</a>	
	<b>James D. East</b> , Monier E, and Garcia-Menendez F. Characterizing and quantifying uncertainty in projections of climate change impacts on air quality. <i>Environmental Research Letters</i> , 17(9), 2022. URL: <a href="https://doi.org/10.1088/1748-9326/ac8d17">https://doi.org/10.1088/1748-9326/ac8d17</a>	

**James D. East**, Henderson BH, Napelenok SL, Koplitz SN, Sarwar G, Gilliam R, Lenzen A, Tong DQ, Pierce RB, and Garcia-Menendez F. Inferring and evaluating satellite-based constraints on no<sub>x</sub> 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, Hogrefe C, Golam S, **East JD**, Madden JM, Mathur R, and Henderson BH. Assessing the impact of lightning no<sub>x</sub> emissions in cmaq using lightning flash data from wwlIn over the contiguous united states. *Atmosphere*, 13(8), 2022. URL: <https://www.mdpi.com/2073-4433/13/8/1248>

**James D. East**, Montealegre JS, Pachon JE, and Garcia-Menendez F. 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 Garcia-Menendez F. *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/ODSY-WH17>

Fernando Garcia-Menendez, **East JD**, Pienkosz BD, and Monier E. Climate model response uncertainty in projections of climate change impacts on air quality. In Wanmin G Mensink C and Hakami A, 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](https://doi.org/10.1007/978-3-030-22055-6_69)

Juan S. Montealegre, Vanegas J, Pachon JE, Rojas A, **East, JD**, and Garcia-Menendez F. 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 TALKS

**2024 East, J.D.** et al., Interpreting air pollutant and methane emissions and seasonality on hemispheric to global scales. NASA Jet Propulsion Laboratory Science Visitor and Colloquium Program, Earth Science Seminar. Pasadena, CA. January 23, 2024.

**2023 East, J.D.** et al., Understanding lightning-NO<sub>x</sub> emissions and their air quality impacts using data assimilation of TROPOMI NO<sub>2</sub>. AGU Atmospheric and Space Electricity Early Career seminar. June 8, 2023.

**2023 East, J.D.** et al., Inferring and evaluating satellite-based constraints on NO<sub>x</sub> emissions estimates in air quality simulations. NASA Atmospheric Chemistry and Dynamics Lab Seminar. January 5, 2023.

## SCIENTIFIC PRESENTATIONS

**2024** Mooring et al., Evaluating Stratospheric Methane in GEOS-Chem with Satellite and Balloon Observations. 12A.4. AMS 104th Annual Meeting, Baltimore, MD. January 31, 2024.

**2023** Penn et al., What can we learn about OH from satellite observations of methane? A41C-08. AGU Fall Meeting, San Francisco, CA. December 14, 2023.

**2023** Hancock et al., South American methane: a high-resolution inversion of blended TROPOMI+GOSAT satellite observations. A54C-02. AGU Fall Meeting, San Francisco, CA. December 15, 2023.

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

**2022 East, J.D.** et al., Lightning-NO<sub>x</sub> 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 lightning-NO<sub>x</sub> emissions in CMAQ. CMAS Conference, Chapel Hill, NC. October 18, 2022.

**2022 Madden et al.**, Evaluating methods of representing lightning NO<sub>x</sub> 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<sub>2</sub> 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<sub>2</sub> observations in EPA's CMAQ modeling framework. HAQAST Update22. January 20, 2022.

**2022 East, J.D.** et al., Comparing OMI and TROPOMI NO<sub>2</sub> data assimilation for estimating NO<sub>x</sub> 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<sub>2</sub> and performing NO<sub>x</sub> emissions inversions. CMAS Meeting. November 2, 2021.

**2021 Madden, et al.**, Assessment of the Impact of Lightning NO<sub>x</sub> 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<sub>2</sub> 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<sub>2</sub> 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

- 2023 East, J.D.** et al., Interpreting the Seasonality of Atmospheric Methane. B21K-2111. AGU Fall Meeting, San Francisco, CA. December 12, 2023.
- 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<sub>2</sub> - 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<sub>2</sub> - 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<sub>2</sub> Data Assimilation for Estimating NO<sub>x</sub> Emissions. AGU Fall Meeting. December 13, 2021.
- 2021 Madden, M.** et al., Comprehensive Evaluation of Hemispheric CMAQ Lightning NO<sub>x</sub> Simulations. AGU Fall Meeting. December 13, 2021.
- 2021 East, J.D.** et al., Assimilating satellite observations of NO<sub>2</sub> 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<sub>2.5</sub> 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), L<sup>A</sup>T<sub>E</sub>X, 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

**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; Environmental Science & Technology*

**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](http://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.