

James D. East

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EDUCATION

North Carolina State University, Raleigh, NC

Ph.D., Environmental Engineering

May 2023 (passed defense November 2022)

Dissertation: 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. Masters of Environmental Engineering

December 2019

North Carolina State University, Raleigh, NC

B.S. Environmental Engineering, *summa cum laude*

May 2015

EXPERIENCE

Postdoctoral Fellow

February 2023 -

PI: Daniel Jacob

Harvard University

Cambridge, MA

ORISE Research Fellow

January 2020 - January 2023

Project title: Integrating Chemical Data Assimilation into the Community Multiscale Air Quality Modeling System.

Research mentor: Barron H. Henderson

U.S. Environmental Protection Agency

Research Triangle Park, NC

Graduate Research Assistant

August 2017 - January 2020

Advised by Dr. Fernando Garcia Menendez in the Department of Civil, Construction, and Environmental Engineering.

NC State University

Raleigh, NC

Designer I

2015 - 2017

Stormwater design engineer. Earned EIT certification.

John R. McAdams Company

Durham, NC

Undergraduate Research Assistant

2014-2015

Advised by Dr. Emily Berglund

NC State University

Raleigh, NC

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. Kopplitz, 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 wwilln 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/ODSY-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>

SCIENTIFIC PRESENTATIONS

2023 East, J.D., Henderson, B.H., Koplitz, K.N., Napelenok, S.N., Sarwar, G., Gilliam, R., Lenzen, A., Tong, D.Q., Pierce, R.B., Madden, M., Kang, D., Garcia Menendez, F. Inferring and evaluating satellite-based constraints on NO_x emissions estimates in air quality simulations. NASA Atmospheric Chemistry and Dynamics Lab Seminar. January 5, 2023.

2022 East, J.D., Madden, J.M., Henderson, B.H., Koplitz, K.N., Napelenok, S.N., Kang, D., Garcia Menendez, F. Lightning-NO_x Emissions, Impacts, and Evaluation Using Satellite Data Assimilation and Remote Observations. AE13A-08. AGU Fall Meeting, December 13, 2022.

2022 Sparks, M., Saari, R., Farahbakhsh, I., Anand, M., Bauch, C., Garcia-Menendez, F., **East, J.D.**, Mirabelli, M., Monier, E., Lickley, M., Conlon, K. 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., Madden, J.M., Henderson, B.H., Koplitz, K.N., Napelenok, S.N., Kang, D., Garcia Menendez, F. Applying satellite data assimilation to infer lightning-NO_x emissions in CMAQ. 21st Annual CMAS Conference, Chapel Hill, NC. October 18, 2022.

2022 Madden, M., Kang, D., **East, J.D.**, Sarwar, G., Hogrefe, C., Mathur, R., Henderson, B.H. Evaluating methods of representing lightning NO_x emissions across the Northern Hemisphere. 21st Annual CMAS Conference, Chapel Hill, NC. October 18, 2022.

2022 East, J.D.. Henderson, B.H., Napelenok, S.L., Koplitz, S.N., Pierce, R.B., Tong, D.Q., Lenzen, A., Gilliam, R.C., Sarwar, G., Garcia Menendez, F. Advancing the use of satellite NO₂ 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., Henderson, B.H., Napelenok, S.L., Koplitz, S.N., Pierce, R.B., Tong, D.Q., Lenzen, A., Gilliam, R.C., Sarwar, G., Garcia Menendez, F. Inferring air pollutant emissions using satellites. Environmental, Water Resources, and Coastal Engineering Symposium at NC State. March 4, 2022.

2022 East, J.D., Henderson, B.H., Napelenok, S.L., Koplitz, S.N., Pierce, R.B., Tong, D.Q., Lenzen, A., Gilliam, R.C., Sarwar, G., Garcia Menendez, F. Applying OMI and TROPOMI NO₂ observations in EPA's CMAQ modeling framework. HAQAST Update22. January 20, 2022.

2022 East, J.D., Henderson, B.H., Napelenok, S.L., Koplitz, S.N., Pierce, R.B., Tong, D.Q., Lenzen, A., Gilliam, R.C., Sarwar, G., Garcia Menendez, F. Comparing OMI and TROPOMI NO₂ data assimilation for estimating NO_x emissions. Presentation to EPA Air Quality Model Applications Group. January 5, 2022.

2021. East, J.D., Henderson, B.H., Napelenok, S.L., Kopplitz, S.N., Pierce, R.B., Tong, D.Q., Lenzen, A., Gilliam, R.C., Sarwar, G., Garcia Menendez, F. Enhanced representation of inter-continental pollutant transport by assimilating satellite NO₂ and performing NO_x emissions inversions. CMAS Meeting. November 2, 2021.

2021 Madden, M., Kang, D., **East, J.D.**, Sarwar, G., Hogrefe, C., Mathur, R., Henderson, B.H. Assessment of the Impact of Lightning NO_x on Air Quality over the Northern Hemisphere. CMAS Meeting. November 2, 2021.

2021 East, J.D., Henderson, B.H., Napelenok, S.L., Kopplitz, S.N., Pierce, R.B., Lenzen, A., Garcia Menendez, F. 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., Henderson, B.H., Napelenok, S.L., Kopplitz, S.N., Pierce, R.B., Lenzen, A., Garcia Menendez, F. Early Career Seminar presenter. National Leadership Training Organization, U.S. EPA. March 25, 2021.

2020 East, J.D., Henderson, B.H., Napelenok, S.L., Kopplitz, S.N., Pierce, R.B., Lenzen, A., Gilliam, R.C., Sarwar, G., Garcia Menendez, F. Implementing satellite NO₂ 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., Henderson, B.H., Napelenok, S.L., Kopplitz, S.N., Pierce, R.B., Lenzen, A., Gilliam, R.C., Sarwar, G., Garcia Menendez, F. Implementing satellite NO₂ data assimilation in CMAQ for identifying emissions biases and improving regional boundary conditions. CMAS Conference. October 27, 2020.

2020 East, J.D., Kopplitz, S.N., Napelenok, S.L., Henderson, B.H., Garcia Menendez, F. 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., **East, J.D.**, Saari, R., Monier, E. 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., Montealegre, J. S., Pachón, J. E., Garcia-Menendez, F. 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., Montealegre, J. S., Pachón, J. E., Garcia-Menendez, F. 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., **East, J.D.**, Saari, R., Monier, E. 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., Monier, E., Saari, R., Garcia-Menendez, F. 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. Henderson, B.H., Qu, Z., Napelenok, S.L., Kopplitz, S.N., Pierce, R.B., Tong, D.Q., Lenzen, A., Gilliam, R.C., Sarwar, G., Garcia Menendez, F. Assimilation of NO₂ - A comparison of multiple products and multiple models. Poster at the International GEOS-Chem Conference. June 8, 2022.

2022 East, J.D. Henderson, B.H., Qu, Z., Napelenok, S.L., Kopplitz, S.N., Pierce, R.B., Tong, D.Q., Lenzen, A., Gilliam, R.C., Sarwar, G., Garcia Menendez, F. Assimilation of NO₂ - A comparison of multiple products and multiple models. Poster at the TEMPO Science Team Meeting. June 1, 2022.

2021 East, J.D., Henderson, B.H., Napelenok, S.L., Kopplitz, S.N., Pierce, R.B., Tong, D.Q., Lenzen, A., Gilliam, R.C., Sarwar, G., Garcia Menendez, F. Comparing OMI and TROPOMI NO₂ Data Assimilation for Estimating NO_x Emissions. AGU Fall Meeting. December 13, 2021.

2021 Madden, M., Kang, D., **East, J.D.**, Sarwar, G., Hogrefe, G., Mathur, R., Henderson, BH. Comprehensive Evaluation of Hemispheric CMAQ Lightning NO_x Simulations. AGU Fall Meeting. December 13, 2021.

2021 East, J.D., Henderson, BH., Napelenok, SL., Koplitz, SN., Pierce, RB., Lenzen, A., Gilliam, RC., Sarwar, G., Garcia Menendez, F. Assimilating satellite observations of NO₂ 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., Monier, E., and Garcia-Menendez, F. 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., Monier, M., Garcia Menendez, F. Impact of climate uncertainty on projections of PM_{2.5} pollution over the US. AAAR Conference. October 5, 2020.

2020 East, J.D., Koplitz, SN., Napelenok, SL., Henderson, BH., Garcia Menendez, F. 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., Montealegre, J. S., Vanegas, J. S., Garcia-Menendez, F., and Pachon, J. E. 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^AT_EX, 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. 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.