

James D. East, Ph.D.

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Education	Ph.D., Environmental Engineering 2023 North Carolina State University, Raleigh, NC <i>Faculty Advisor:</i> Fernando Garcia Menendez, Associate Professor
	B.S., Environmental Engineering 2015 North Carolina State University, Raleigh, NC
Experience	Postdoctoral Fellow Harvard University 2023 - present Cambridge, MA School of Engineering and Applied Sciences <i>Faculty Mentor:</i> Daniel Jacob, Professor
	ORISE Research Fellow U.S. Environmental Protection Agency 2020 - 2023 Research Triangle Park, NC Office of Research and Development <i>Mentors:</i> Barron H. Henderson, Sergey Napelenok
	Graduate Research Assistant NC State University 2017 - 2020 Raleigh, NC Department of Civil, Construction, and Environmental Engineering <i>Faculty Advisor:</i> Fernando Garcia Menendez, Associate Professor
	Designer I John R. McAdams Company 2015 - 2017 Durham, NC Design engineer
	Undergraduate Research Assistant NC State University 2014-2015 Raleigh, NC Department of Civil, Construction, and Environmental Engineering <i>Faculty Advisor:</i> Emily Berglund, Professor
	First-author Publications 7 James D. East , E Monier, RK Saari, and F Garcia-Menendez. Projecting changes in the frequency and magnitude of ozone pollution events under uncertain climate sensitivity. <i>Earth's Future</i> , 12(6):e2023EF003941, 2024. https://doi.org/10.1029/2023EF003941 (<i>n</i> =5) Google Scholar ORCID Media: American Association of Medical Colleges NC State News
	6 James D. East , DJ Jacob, N Balasus, AA Bloom, LP Bruhwiler, Z Chen, JO Kaplan, LJ Mickley, TA Mooring, E Penn, B Poulter, MP Sulprizio, JR Worden, RM Yantosca, and Z Zhang. Interpreting the seasonality of atmospheric methane. <i>Geophysical Research Letters</i> , 51(10):e2024GL108494, 2024. https://doi.org/10.1029/2024GL108494
	4 James D. East , E Monier, and F Garcia-Menendez. Characterizing and quantifying uncertainty in projections of climate change impacts on air quality. <i>Environmental Research Letters</i> , 17(9), 2022. https://doi.org/10.1088/1748-9326/ac8d17
	3 James D. East , BH Henderson, SL Napelenok, SN Koplitz, G Sarwar, R Gilliam, A Lenzen, DQ Tong, RB 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. <https://acp.copernicus.org/articles/22/15981/2022/>

1 James D. East, JS Montealegre, JE Pachon, and F Garcia-Menendez. Air quality modeling to inform pollution mitigation strategies in a Latin American megacity. *Science of The Total Environment*, 776(145894), 2021. <https://doi.org/10.1016/j.scitotenv.2021.145894>

Media: [NC State News](#) | [Environmental News Network](#)

Co-author Publications

(*n=12*)

*Submitted

17 LA Estrada, DJ Varon, MP Sulprizio, H Nesser, Z Chen, N Balasus, SE Hancock, M He, **East, JD**, TA Mooring, AO Alonso, JD Maasakkers, I Aben, S Baray, KW Bowman, JR Worden, FJ Cardoso-Saldaña, E Reidy, and DJ Jacob. Integrated Methane Inversion (IMI) 2.0: an improved research and stakeholder tool for monitoring total methane emissions with high resolution worldwide using TROPOMI satellite observations. *Geosci. Model Dev.*, 2025. <https://doi.org/10.5194/gmd-18-3311-2025>

***16** M He, DJ Jacob, LA Estrada, DJ Varon, M Sulprizio, N Balasus, **East, JD**, E Penn, DC Pendergrass, Z Chen, TA Mooring, JD Maasakkers, PG Brodrick, C Frankenberg, KW Bowman, and L Bruhwiler. Attributing 2019-2024 methane growth using tropomi satellite observations. *ESS Open Archive (preprint)*, 2025. <https://doi.org/10.22541/essoar.174886142.25607118/v1>

***15** X Wang, DJ Jacob, H Nesser, N Balasus, L Estrada, MP Sulprizio, DH Cusworth, TR Scarpelli, Z Chen, **East, JD**, and DJ Varon. Quantifying urban and landfill methane emissions in the united states using tropomi satellite data. *arXiv*, 2025. <https://doi.org/10.48550/arXiv.2505.10835>

14 Z Chen, JD Jacob, H Lin, N Balasus, A Hardy, **East, JD**, Y Zhang, BR Runkle, SE Hancock, CA Taylor, X Du, and BO Sander. Global Rice Paddy Inventory (GRPI): a high-resolution inventory of methane emissions from rice agriculture based on Landsat satellite inundation datat. *Earth's Future*, 2025. <https://doi.org/10.1029/2024EF005479>

***13** DC Pendergrass, DJ Jacob, N Balasus, L Estrada, DJ Varon, **East, JD**, M He, TA Mooring, E Penn, H Nesser, and JR Worden. Trends and seasonality of 2019–2023 global methane emissions inferred from a localized ensemble transform kalman filter (CHEEREIO v1.3.1) applied to tropomi satellite observations. *Atmos. Chem. Phys. (submitted)*, 2025. <https://doi.org/10.5194/egusphere-2025-1554>

12 E Penn, DJ Jacob, Z Chen, **East, JD**, MP Sulprizio, L Bruhwiler, JD Maasakkers, H Nesser, Z Qu, Y Zhang, and W Worden. What can we learn about tropospheric OH from satellite observations of methane? *Atmos. Chem. Phys.*, 2025. <https://doi.org/10.5194/acp-25-2947-2025>

11 LH Yang, DJ Jacob, H Lin, R Dang, KH Bates, **East, JD**, KR Travis, DC Pendergrass, and LT Murray. Model underestimates of OH reactivity cause overestimate of hydrogen’s climate impact. *Geophysical Research Letters*, 52:e2024GL112445, 2025. <https://doi.org/10.1029/2024GL112445>

10 Q Zhu, DJ Jacob, K Yuan, F Li, BRK Runkle, M Chen, AA Bloom, B Poulter, **East, JD**, WJ Riley, G McNicol, J Worden, C Frankenberg, and M Halabisky.

Advancements and opportunities to improve bottom-up estimates of global wetland methane emissions. *Environmental Research Letters*, 20:023001, 2025. <https://doi.org/10.1088/1748-9326/adad02>

9 SE Hancock, DJ Jacob, Z Chen, H Nesser, A Davitt, DJ Varon, MP Sulprizio, N Balasus, LA Estrada, M Cazorla, L Dawidowski, S Diez, **East, JD**, E Penn, CA. Randles, JR Worden, I Aben, RJ Parker, and JD Maasakkers. Satellite quantification of methane emissions from South American countries: A high-resolution inversion of TROPOMI and GOSAT observations. *Atmospheric Chemistry and Physics*, 25:797–817, 2025. <https://doi.org/10.5194/acp-25-797-2025>

*8 CA Quinn, T Colligan, EJ Ward, **East, JD**, Y Lim, E Lee, R Koster, and B Poulter. Seasonal forecasts support monitoring of Amazonia wetland methane response to 2023 El Niño. *JAMES (submitted)*, 2025. <https://doi.org/10.22541/essoar.173870855.53162706/v1>

5 Matt S. Sparks, I Farahbakhsh, M Anand, CT Bauch, KC Conlon, **JD East**, 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. *Proceedings of the National Academy of Sciences*, 121(5):e2215685121, 2024. <https://doi.org/10.1073/pnas.2215685121>

2 Daiwen Kang, C Hogrefe, S Golam, **JD East**, JM Madden, R Mathur, and BH Henderson. Assessing the Impact of Lightning NO_x Emissions in CMAQ Using Lightning Flash Data from WLLN over the Contiguous United States. *Atmosphere*, 13(8), 2022. <https://www.mdpi.com/2073-4433/13/8/1248>

Additional Publications

- **James D. East** and F 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. <http://dx.doi.org/10.5065/ODSY-WH17>
- Fernando Garcia-Menendez, **JD East**, BD Pienkosz, and E Monier. 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. https://doi.org/10.1007/978-3-030-22055-6_69
- Juan S. Montealegre, J Vanegas, JE Pachon, A Rojas, **JD East**, and F 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 (CASAP)*, pages 1–4, 2019. <https://doi.org/10.1109/CASAP48673.2019.9364063>

Invited Talks

- 2025 Michigan State University. East Lansing, MI. March 2025.
- 2024 Air & Waste Management Association - RTP Chapter. April 2024.
- 2024 Harvard University SEAS Cross Area Seminar. Cambridge, MA. March 2024.
- 2024 NASA Jet Propulsion Laboratory. Pasadena, CA. January 2024.
- 2023 AGU Atmospheric and Space Electricity Early Career seminar. June 2023.
- 2023 NASA Atmospheric Chemistry and Dynamics Lab Seminar. January 2023.

2022 HAQAST Update22 speaker and panelist ([link](#)). January 2022.

Selected Conference Presentations

2025 EGU General Assembly 2025, Vienna, Austria. May 1, 2025. [EGU25-14476](#)
2024 AGU24, Washington, DC. December 12, 2024 [B43K-03](#)
2024 11th International GEOS-Chem Meeting. St. Louis, MO. June 13, 2024.
2023 Task Force on Hemispheric Transport of Air Pollution. April 21, 2023.
2022 AGU Fall Meeting, Chicago, IL. December 13, 2022. [AE13A-08](#)
2022 CMAS Conference, Chapel Hill, NC. October 18, 2022.
2022 Environmental Engineering Symposium at NC State. March 4, 2022.
2022 HAQAST Update22. January 20, 2022.
2021 CMAS Conference, Chapel Hill, NC. November 2, 2021.
2021 Science on Earth Day “ScED” Talks, U.S. EPA, ORD. April 22, 2021.
2021 Early Career Seminar. NLTO. U.S. EPA. March 25, 2021.
2020 CMAS Conference, Chapel Hill, NC. October 27, 2020.
2019 CASAP Conference. Barranquilla, Colombia. August 14, 2019.
2019 NC Breathe Conference. Wilmington, NC. April 11, 2019.

Selected Poster Presentations

2023 AGU Fall Meeting, San Francisco, CA. December 12, 2023. [B21K-2111](#)
2022 AGU Fall Meeting, Chicago, IL. December 16, 2022. [A52N-1166](#)
2022 11th International GEOS-Chem Conference. June 8, 2022.
2022 TEMPO Science Team Meeting. June 1, 2022.
2021 AGU Fall Meeting, New Orleans, LA. December 13, 2021. [A15B-1625](#)
2021 Environmental Engineering Symposium at NC State. February 26, 2021.
2020 AGU Fall Meeting. December 10, 2020. [GC060-0006](#)
2020 AAAR Conference. October 5, 2020.
2020 HAQAST Showcase. July 21, 2020.
2019 NC State University Latin American Research Symposium. February 2019.
2018 111th Air & Waste Management Association, Hartford, CT. June 25, 2018.
2015 108th Air & Waste Management Association, Raleigh, NC. June 22, 2015.

Teaching & Mentoring

Teaching Assistant

Fundamentals of Environmental Engineering. NC State University. Spring 2018.
• Weekly office hours. Graded tests and assignments. Solutions for class site.

Guest Lecturer

Environmental Modeling. NC State University. Spring 2022.
• Lecture and active learning jupyter notebook activity.

Research Mentoring

Grace Gould, undergraduate, NC State University
• NC State University REU Summer Program. Research symposium poster.
Sophie Farr, undergraduate, Vassar College
• Harvard University SPHEER. AGU24 poster.

Awards & Fellowships

Fellowships

U.S. Environmental Protection Agency ORISE Fellowship. 2020-2023. \$180,000

Grants

Jacob, DJ. and **East, JD** (*co-PI*). “Integration of gridded GHGSat and TROPOMI satellite data to quantify methane emissions on national and regional scales.” GHGSat, Inc. May 2024 - April 2026. \$100,000.

East, JD and Jacob, DJ. “Construction of Jacobian matrices for inversion of satellite methane observations.” Harvard FAS Research Computing. January 2023. 870,912 core-hours.

Awards

Finalist. Three Minute Thesis. University level. NC State University. 2022.

[Talk video](#) | [Dept. News Article](#)

1st Place. Three Minute Thesis. Department level. NC State University. 2022.

[Dept. News Article](#)

1st Place. Masters student poster competition. AWMA ACE. 2018.

[Dept. News Article](#)

Honorable Mention Poster. EWC Symposium, NC State University. 2018.

1st Place. Undergrad student poster competition, AWMA ACE. 2015.

[Dept. News Article](#)

Academic Recognition

Sustainability Research and Study Related to Air Quality and Waste Management Award. Air & Waste Management Association. 2019.

Graduate Merit Award. Dept. of Civil, Construction, and Environmental Engineering. NC State University. 2017.

Travel Funding

NC State Graduate School competitive funding award. Summer 2019.

Synergistic Activities

Co-lead Methane subgroup. Atmospheric Chemistry Modeling Group, Harvard University.

Session Convener AGU24 Fall Meeting. Atmospheric Sciences Section. Targeting Methane Mitigation: Quantification of Anthropogenic Methane Sources at All Scales Through Atmospheric Measurement ([Session](#)).

Peer-review *Environmental Pollution; Environmental Science & Technology; JGR: Atmospheres; Biogeosciences; Atmospheric Chemistry & Physics*

Seminar Coordinator Atmospheric & Environmental Chemistry Seminar. Harvard University. Spring 2024.

Participant EPA Methane Inverse Modeling Technical Workshop. Research Triangle Park, NC. July 2024.

Guest instructor Boy Scouts Merit Badge College. NC State University. Spring 2018. Taught about global air pollution.

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

Professional Memberships

American Geophysical Union, European Geophysical Union, A&WMA