James D. East, Ph.D.

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Email: jeast@g.harvard.edu   Website: https://eastjames.github.io

Education	**Ph.D., Environmental Engineering**	2023

North Carolina State University, Raleigh, NC
Faculty Advisor: 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
Faculty Mentor: Daniel Jacob, Professor

Methane Remote Sensing Specialist — UN Environment Programme
2025 - present
Research consultant at the International Methane Emissions Observatory (IMEO)

ORISE Research Fellow — U.S. Environmental Protection Agency
2020 - 2023 — Research Triangle Park, NC
Office of Research and Development
Mentors: Barron H. Henderson, Sergey Napelenok

Graduate Research Assistant — NC State University
2017 - 2020 — Raleigh, NC
Department of Civil, Construction, and Environmental Engineering
Faculty Advisor: 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
Faculty Advisor: Emily Berglund, Professor

Publications
n=6 as first author
∗Submitted
Google Scholar
ORCiD

21 CA Quinn, T Colligan, EJ Ward, **JD East**, Y Lim, E Lee, R Koster, and B Poulter. Amazonia Wetland Methane Emission Decrease in 2023: Seasonal Forecasting of Global Wetlands Highlights Monitoring Targets in Critical Ecosystems. *JAMES*, 2025. https://doi.org/10.1029/2025MS005510

∗**20** SE Hancock, DJ Jacob, R Jimenez, A Ardila, L Morales-Rincon, N Rojas, LA Estrada, N Balasus, **JD East**, MP Sulprizio, X Wang, JL France, L Potyk, E Penn, Z Chen, DJ Varon, C Frankenberg, M Baranski, A Calcan, and RJ Parker. Applying satellite observations to improve bottom-up national emission inventories for methane: Application to Colombia. *EGUSphere (preprint)*, 2025

∗**19** M Sparks, **JD East**, F Garcia-Menendez, E Monier, and R Saari. Air quality alerts, health impacts, and adaptation implications under varying climate policy. *submitted*, 2025

∗**18 JD East**, DJ Jacob, D Jervis, N Balasus, LA Estrada, SE Hancock, MP Sulprizio, J Thomas, X Wang, Z Chen, DJ Varon, and J Worden. Worldwide inference of national methane emissions by inversion of satellite observations and UNFCCC prior estimates. *Nature Communications (accepted).* https://doi.org/10.31223/X55T7W

    Website: WorldWideMethaneEmissions.com

∗**17** DJ Varon, JD Jacob, LA Estrada, N Balasus, **JD East**, DC Pendergrass, Z Chen, MP Sulprizio, M Omara, R Gautam, ZR Barkley, FJ Cardoso-Saldaña, EK Reidy, H Kamdar, ED Sherwin, S Biraud, D Jervis, S Pandey, J Worden, KW Bowman, JD Maasakkers, and RL Kleinberg. Seasonality and declining intensity of methane emissions from the permian and nearby us oil and gas basins. *EarthArXiv (preprint)*, 2025. https://doi.org/10.31223/X56B2G

∗**16** M He, DJ Jacob, LA Estrada, DJ Varon, M Sulprizio, N Balasus, **JD East**, 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, **JD East**, 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 DC Pendergrass, DJ Jacob, N Balasus, L Estrada, DJ Varon, **JD East**, 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.*, 2025. https://doi.org/10.5194/acp-25-14353-2025

13 LA Estrada, DJ Varon, MP Sulprizio, H Nesser, Z Chen, N Balasus, SE Hancock, M He, **JD East**, 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

12 Z Chen, JD Jacob, H Lin, N Balasus, A Hardy, **JD East**, 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

11 E Penn, DJ Jacob, Z Chen, **JD East**, 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

10 LH Yang, DJ Jacob, H Lin, R Dang, KH Bates, **JD East**, 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

9 Q Zhu, DJ Jacob, K Yuan, F Li, BRK Runkle, M Chen, AA Bloom, B Poulter, **JD East**, 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`

8 SE Hancock, DJ Jacob, Z Chen, H Nesser, A Davitt, DJ Varon, MP Sulprizio, N Balasus, LA Estrada, M Cazorla, L Dawidowski, S Diez, **JD East**, 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`

7 JD East, E Monier, RK Saari, and F Garcia-Menendez. Projecting changes in the frequency and magnitude of ozone pollution events under uncertain climate sensitivity. *Earth's Future*, 12(6):e2023EF003941, 2024. `https://doi.org/10.1029/2023EF003941`
    Media: American Association of Medical Colleges | NC State News

6 JD 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. *Geophysical Research Letters*, 51(10):e2024GL108494, 2024. `https://doi.org/10.1029/2024GL108494`

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`

4 JD East, E Monier, and F Garcia-Menendez. Characterizing and quantifying uncertainty in projections of climate change impacts on air quality. *Environmental Research Letters*, 17(9), 2022. `https://doi.org/10.1088/1748-9326/ac8d17`

3 JD 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/`

2 Daiwen Kang, C Hogrefe, S Golam, **JD East**, JM Madden, R Mathur, and BH 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. `https://www.mdpi.com/2073-4433/13/8/1248`

1 JD 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

Additional Publications

• **JD 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/10.5065/0DSY-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	**2025**	NASA Carbon Monitoring System science team meeting. September 9, 2025.
	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.

Funding & Awards

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

Grants
DJ Jacob, **JD East** *(co-I)*, et al. Continued Development and Application of a Prototype System for Exploiting Satellite Data to Improve Knowledge of Methane Emissions on Urban to Global Scales. NASA Carbon Monitoring System. 2023-2026.

DJ Jacob and **JD East** *(co-I)*. "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.

JD East and DJ Jacob. "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	**Science Team Member** NASA Carbon Monitoring System. Methane Working Group. 2025 - present.

Science Team Member NASA Carbon Monitoring System. Methane Working Group. 2025 - present.

Session Convener AGU24, AGU25. Atmospheric Sciences Section. Targeting Methane Mitigation: Quantification of Anthropogenic Methane Sources at All Scales Through Atmospheric Measurement (Session).

Co-lead Methane subgroup. Atmospheric Chemistry Modeling Group, Harvard University. 2024 - present.

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

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