

James D. East, Ph.D.

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Education	Ph.D., Environmental Engineering North Carolina State University, Raleigh, NC <i>Faculty Advisor:</i> Fernando Garcia Menendez, Associate Professor	2023
	B.S., Environmental Engineering North Carolina State University, Raleigh, NC	2015
Experience	Postdoctoral Fellow 2023 - present School of Engineering and Applied Sciences <i>Faculty Mentor:</i> Daniel Jacob, Professor	Harvard University Cambridge, MA
	Research Consultant 2025 - present International Methane Emissions Observatory (IMEO) Methane Remote Sensing Specialist	UN Environment Programme
	ORISE Research Fellow 2020 - 2023 Office of Research and Development <i>Mentors:</i> Barron H. Henderson, Sergey Napelenok	U.S. Environmental Protection Agency Research Triangle Park, NC
	Graduate Research Assistant 2017 - 2020 Department of Civil, Construction, and Environmental Engineering <i>Faculty Advisor:</i> Fernando Garcia Menendez, Associate Professor	NC State University Raleigh, NC
	Designer I 2015 - 2017 Design engineer	John R. McAdams Company Durham, NC
	Undergraduate Research Assistant 2014-2015 Department of Civil, Construction, and Environmental Engineering <i>Faculty Advisor:</i> Emily Berglund, Professor	NC State University Raleigh, NC
Publications	*20 M Sparks, JD East , F Garcia-Menendez, E Monier, and R Saari. Air quality alerts, health impacts, and adaptation implications under varying climate policy. <i>submitted</i> , 2025	
<i>n=6 as first author</i>		
<i>*Submitted</i>		
Google Scholar		
ORCiD		
	*19 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. <i>Nature Communications (accepted)</i> . https://doi.org/10.31223/X55T7W	
	Website: WorldWideMethaneEmissions.com	
	*18 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>

***17** 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>

***16** 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>

15 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>

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

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/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

- 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.

Synergistic Activities	<p>Travel Funding NC State Graduate School competitive funding award. Summer 2019.</p> <p>Science Team Member NASA Carbon Monitoring System. Methane Working Group. 2025 - present.</p> <p>Session Convener AGU24, AGU25. Atmospheric Sciences Section. Targeting Methane Mitigation: Quantification of Anthropogenic Methane Sources at All Scales Through Atmospheric Measurement (Session).</p> <p>Co-lead Methane subgroup. Atmospheric Chemistry Modeling Group, Harvard University. 2024 - present.</p> <p>Peer-review <i>Environmental Pollution; Environmental Science & Technology; JGR: Atmospheres; Biogeosciences; Atmospheric Chemistry & Physics; Scientific Data</i></p> <p>Seminar Coordinator Atmospheric & Environmental Chemistry Seminar. Harvard University. Spring 2024.</p> <p>Participant EPA Methane Inverse Modeling Technical Workshop. Research Triangle Park, NC. July 2024.</p> <p>Guest instructor Boy Scouts Merit Badge College. NC State University. Spring 2018. Taught about global air pollution.</p> <p>A&WMA Student Chapter NC State University. Secretary, 2019-2020. President, 2018-2019.</p>
Professional Memberships	American Geophysical Union, European Geophysical Union, A&WMA