

# James D. East, Ph.D.

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Email: [jeast@g.harvard.edu](mailto:jeast@g.harvard.edu)

Website: <https://eastjames.github.io>

Education	<b>Ph.D., Environmental Engineering</b> 2023 North Carolina State University, Raleigh, NC <i>Faculty Advisor:</i> Fernando Garcia Menendez, Associate Professor
	<b>B.S., Environmental Engineering</b> 2015 North Carolina State University, Raleigh, NC
Experience	<b>Postdoctoral Fellow</b> Harvard University 2023 - present Cambridge, MA School of Engineering and Applied Sciences <i>Faculty Mentor:</i> Daniel Jacob, Professor
	<b>Methane Remote Sensing Specialist</b> UN Environment Programme 2025 - present Research consultant at the International Methane Emissions Observatory (IMEO)
	<b>ORISE Research Fellow</b> U.S. Environmental Protection Agency 2020 - 2023 Research Triangle Park, NC Office of Research and Development <i>Mentors:</i> Barron H. Henderson, Sergey Napelenok
	<b>Graduate Research Assistant</b> NC State University 2017 - 2020 Raleigh, NC Department of Civil, Construction, and Environmental Engineering <i>Faculty Advisor:</i> Fernando Garcia Menendez, Associate Professor
	<b>Designer I</b> John R. McAdams Company 2015 - 2017 Durham, NC Design engineer
	<b>Undergraduate Research Assistant</b> NC State University 2014-2015 Raleigh, NC Department of Civil, Construction, and Environmental Engineering <i>Faculty Advisor:</i> Emily Berglund, Professor
Publications	<b>21 JD East</b> , 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 with UNFCCC prior estimates. <i>Nature Communications</i> . <a href="https://doi.org/10.1038/s41467-025-67122-8">https://doi.org/10.1038/s41467-025-67122-8</a> Website: <a href="https://WorldWideMethaneEmissions.com">WorldWideMethaneEmissions.com</a>
<i>n=6 as first author</i>	<b>20</b> CA Quinn, T Colligan, EJ Ward, <b>JD East</b> , 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. <i>JAMES</i> , 2025. <a href="https://doi.org/10.1029/2025MS005510">https://doi.org/10.1029/2025MS005510</a>
*Submitted	<b>*19</b> SE Hancock, DJ Jacob, R Jimenez, A Ardila, L Morales-Rincon, N Rojas, LA Estrada, N Balasus, <b>JD East</b> , MP Sulprizio, X Wang, JL France, L Potyk, E Penn, Z Chen, DJ Varon, C Frankenberg, M Baranski, A Calcan, and RJ Parker.
Google Scholar	
ORCID	

Applying satellite observations to improve bottom-up national emission inventories for methane: Application to Colombia. *EGUSphere (preprint)*, 2025

\***18** 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

\***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 data. *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<sub>x</sub> 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 NO<sub>x</sub> 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](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.

<b>Selected Poster Presentations</b>	<b>2025</b> NASA Carbon Monitoring System science team meeting. September 9, 2025.
	<b>2023</b> AGU Fall Meeting, San Francisco, CA. December 12, 2023. <a href="#">B21K-2111</a>
	<b>2022</b> AGU Fall Meeting, Chicago, IL. December 16, 2022. <a href="#">A52N-1166</a>
	<b>2022</b> 11th International GEOS-Chem Conference. June 8, 2022.
	<b>2022</b> TEMPO Science Team Meeting. June 1, 2022.
	<b>2021</b> AGU Fall Meeting, New Orleans, LA. December 13, 2021. <a href="#">A15B-1625</a>
	<b>2021</b> Environmental Engineering Symposium at NC State. February 26, 2021.
	<b>2020</b> AGU Fall Meeting. December 10, 2020. <a href="#">GC060-0006</a>
	<b>2020</b> AAAR Conference. October 5, 2020.
	<b>2020</b> HAQAST Showcase. July 21, 2020.
	<b>2019</b> NC State University Latin American Research Symposium. February 2019.
	<b>2018</b> 111th Air & Waste Management Association, Hartford, CT. June 25, 2018.
	<b>2015</b> 108th Air & Waste Management Association, Raleigh, NC. June 22, 2015.
<b>Teaching &amp; Mentoring</b>	<b>Teaching Assistant</b> Fundamentals of Environmental Engineering. NC State University. Spring 2018. <ul style="list-style-type: none"> <li>• Weekly office hours. Graded tests and assignments. Solutions for class site.</li> </ul>
	<b>Guest Lecturer</b> Environmental Modeling. NC State University. Spring 2022. <ul style="list-style-type: none"> <li>• Lecture and active learning jupyter notebook activity.</li> </ul>
	<b>Research Mentoring</b> Grace Gould, undergraduate, NC State University <ul style="list-style-type: none"> <li>• NC State University REU Summer Program. Research symposium poster.</li> </ul>
	Sophie Farr, undergraduate, Vassar College <ul style="list-style-type: none"> <li>• Harvard University SPHEER. AGU24 poster.</li> </ul>
<b>Funding &amp; Awards</b>	<b>Fellowships</b> U.S. Environmental Protection Agency ORISE Fellowship. 2020-2023. \$180,000
	<b>Grants</b> DJ Jacob, <b>JD East</b> ( <i>co-I</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 <b>JD East</b> ( <i>co-I</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.
	<b>JD East</b> and DJ Jacob. “Construction of Jacobian matrices for inversion of satellite methane observations.” Harvard FAS Research Computing. January 2023. 870,912 core-hours.
	<b>Awards</b> Finalist. Three Minute Thesis. University level. NC State University. 2022. <a href="#">Talk video</a>   <a href="#">Dept. News Article</a>
	1st Place. Three Minute Thesis. Department level. NC State University. 2022. <a href="#">Dept. News Article</a>

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.

**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