Xueying Yu

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Education

Ph.D. in Land and Atmospheric Science 2017–2022
University of Minnesota-Twin Cities, Department of Soil Water and Climate

M.S. in Meteorology 2014–2017
Nanjing University, School of Atmospheric Sciences

B.S. in Atmospheric Science 2010–2014
Nanjing University, School of Atmospheric Sciences

Research Interests

Carbon Cycle; Remote Sensing; Data Assimilation; Climate Change and Disasters

Awards, Honors, and Funds (†Funded Proposal)

IGC11 Travel Fund (International GEOS-Chem Meeting) 06/2024
†Doctoral Dissertation Fellowship (University of Minnesota; $25,000, declined) 2022–2023
Characterizing Methane Emissions from Point Sources to the Global Budget
†NASA Earth and Space Science Fellowship ($135,000) 2018–2021
Constraining and Projecting Wetland Methane Emissions in the Northern US
ACOM Travel Fund (NCAR FASCINATE workshop) 09/2019
ACOM Travel Fund (Fundamentals of Atmospheric Chemistry and Aerosol Modeling) 08/2018
Graduate Fellowship of LAAS Graduate Program ($23,509) 2017–2018
Outstanding Graduate Student Award of Nanjing University 2017
Outstanding Graduate Student Award of School of Atmospheric Sciences 2017
Academic Scholarship for Graduate Studies of 2016 2016
Academic Scholarship for Graduate Studies of 2015 2015
Academic Scholarship for Graduate Studies of 2014 2014
People Scholarship 2013

Research

Postdoctoral Scholar 2022–present
Global Carbon Project
Department of Earth System Science, Stanford University, US
Advisor: Rob Jackson

- Develop inverse modeling framework of methane, methane isotopes, and ethane
- Develop methane isotope simulations in Chemical Transport Model
- Quantify the global methane budget and interpret drivers of unexpected sources

Research Assistant 2017–2022
Greenhouse Gas Emissions in the Midwest
Department of Soil Water and Climate, University of Minnesota-Twin Cities, US
Advisor: Dylan B. Millet

- Optimized the global methane budget and oxidation chain via space observations
- Evaluated satellite's capabilities to map methane emissions via Observing System Simulation Experiments
- Optimized the methane budget in the US Midwest by aircraft-based inversions

- Quantified point source emissions using an aircraft-based mass-balance approach

Visiting Student (remote) 2020–2022
Department of Mechanical Engineering, University of Colorado at Boulder, US
Advisor: Daven K. Henze
- Improved methane 4D-Var inverse scheme in the GEOS-Chem adjoint model

Research Assistant 2014–2017
Heavy Precipitation Prediction for Major Urban Regions in Eastern China under the Background of Global Climate Change
School of Atmospheric Sciences, Nanjing University, China
Advisor: Xing Chen
- Performed typhoon-related synoptic weather typing
- Projected changes in extreme rainfall pattern on century scale based on CMIP5

Summer Research 07–09/2013
Energy Budget in Atmospheric Boundary Layer
School of Atmospheric Sciences, Nanjing University, China
Advisor: Ning Zhang
- Explored urban effect on energy budget based on eddy covariance system

Elite Program for Future Research 2010–2011
School of Life Sciences, Nanjing University, China
- Took elite courses to strengthen science and programming fundamentals
- Received laboratory training for chemistry and life sciences

Teaching

Guest Lecture on Carbon 02/2024
CP 6190 Introduction to Climate Change Planning
School of City & Regional Planning, Georgia Institute of Technology

Undergraduate Student Mentor 2021–2022
Graduate Student Mentorship Initiative (GSMI) Program, Científico Latino, US

STEM Undergraduate Mentor 03–06/2021
A Friend in STEM Program, University of Minnesota, US

University of Minnesota Preparing Future Faculty Program 2019
- Received professional training of teaching
- Developed a course syllabus and gave example classes

Teaching Assistant 02–07/2016
Statistical Weather Prediction
School of Atmospheric Sciences, Nanjing University, China

Professional Training

Virtual Training Sessions on Satellite Applications 06–08/2021
AMS Satellite Meteorology, Oceanography and Climatology (SatMOC) Committee

Frontiers of Atmospheric Science and Chemistry: Integration of Novel Applications and Technological Endeavors (FASCINATE) Workshop 09/2019
Atmospheric Chemistry Observations & Modeling, National Center for Atmospheric Research (NCAR), US

Fundamentals of Atmospheric Chemistry and Aerosol Modeling Workshop 08/2018
Atmospheric Chemistry Observations & Modeling, NCAR, US

Local Disaster Weather Forecaster Intern 07/2015
Beijing Meteorological Bureau, Beijing, China
- Produced and disseminated reports of local disaster weather forecast
- Supported severe weather monitoring and warning systems
- Recorded daily weather conferences

Weather Forecaster Intern 07/2013
Jiangsu Meteorological Bureau, Jiangsu, China
- Applied radar and satellite data to daily weather forecasting
- Supported daily weather forecasting
- Reorganized 2010–2012 disaster weather files of Jiangsu province

Data Analyst Intern 01/2012
Chifeng Meteorological Bureau, Inner Mongolia, China
- Collected and organized meteorological data from eight weather stations
- Charted and analyzed weather maps
- Wrote scripts for television and broadcast interviews

Service and Outreach

Conference Session Co-chair
AGU 2023 Fall Meeting, Methane Mitigation through Improved Understanding of Methanogenesis, Methanotrophy, and Atmospheric Methane Removal
AGU 2022 Fall Meeting, The Global Methane Cycle

Manuscript Peer Reviewer
Atmospheric Measurement Techniques; Agricultural and Forest Meteorology; Atmospheric Chemistry and Physics; Communications Earth & Environment; Frontiers in Earth Science; Geophysical Research Letters; Geoscientific Model Development; Journal of Geophysical Research – Atmospheres; Nature

Grant Review
Atmospheric Chemistry, Carbon Cycle and Climate (AC4) Program, NOAA (2023); the Council of Graduate Students (COGS) Grant, University of Minnesota (2021)

Conference Presentation Judge
AGU Fall Meeting Outstanding Student Presentation Awards (2023); Stanford School of Sustainability Research Review (2023); AGU Fall Meeting Outstanding Student Presentation Awards (2022); Minnesota State Science & Engineering Fair Grand Award (2021)

Core Team Member of META Workshop 2022–present
Methane Emissions Technology Alliance (META), Stanford University, US

Student Member of AMS Board on Atmospheric Biogeosciences 2020–2022

Seminar Organizer, Graduate Student Academic Community 2014–2017
School of Atmospheric Sciences, Nanjing University, China

Peer-Reviewed Publications

Yu, X., Millet, D. B., Henze, D. K., Turner, A. J., Delgado, A. L., Bloom, A. A., and Sheng, J.: A high-resolution satellite-based map of global methane emissions reveals missing wetland, fossil fuel, and monsoon sources. *Atmospheric Chemistry and Physics*, 23, 3325–3346, 10.5194/acp-23-3325-2023, 2023. Available at: https://acp.copernicus.org/articles/23/3325/2023.

Hu, C., Xiao, W., Griffis, T., Xiao, Q., Wang, S., Zhang, Y., Wang, W., Zhu, L., Chen, X., **Yu, X.**, and Lee, X.: Estimation of anthropogenic CH_4 and CO_2 emissions in Taiyuan-Jinzhong region: One of the world's largest emission hotspots. *Journal of Geophysical Research: Atmospheres*, 128, e2022JD037915, 10.1029/2022JD037915, 2023. Available at: https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2022JD037915.

Chen, Z., Jacob, D., Nesser, H., Sulprizio, M., Lorente, A., Varon, D., Lu, X., Shen, L., Qu, Z., Penn E., and **Yu, X.**: Methane emissions from China: a high-resolution inversion of TROPOMI satellite observations, *Atmospheric Chemistry and Physics*, 22(16), 10809–10826, 10.5194/acp-22-10809-2022, 2022. Available at: https://acp.copernicus.org/articles/22/10809/2022.

Yu, X., Millet, D. B., and Henze, D. K.: How well can inverse analyses of high-resolution satellite data resolve heterogeneous methane fluxes? Observing system simulation experiments with the GEOS-Chem adjoint model (v35), *Geoscientific Model Development*, 14(12), 7775–7793, 10.5194/gmd-14-7775-2021, 2021. Available at: https://gmd.copernicus.org/articles/14/7775/2021.

Yu, X., Millet, D. B., Wells, K. C., Henze, D. K., Cao, H., Griffis, T. J., Kort, E. A., Plant, G., Deventer, M. J., Kolka, R. K., Roman, D. T., Davis, K. J., Desai, A. R., Baier, B. C., McKain, K., Czarnetzki, A. C., and Bloom, A. A.: Aircraft-based inversions quantify the importance of wetlands and livestock for Upper Midwest methane emissions, *Atmospheric Chemistry and Physics*, 21, 951–971, 10.5194/acp-21-951-2021, 2021. Available at: https://acp.copernicus.org/articles/21/951/2021.

Gonzalez, A., Millet, D. B., **Yu, X.**, Wells, K. C., Griffis, T. J., Baier, B. C., Campbell, P. C., Choi, Y., DiGangi, J. P., Gvakharia, A., Halliday, H., Kort, E. A., McKain, K., Nowak, J., and Plant, G.: Fossil vs. non-fossil CO sources in the US: New airborne constraints from ACT-America and GEM, *Geophysical Research Letters*, 48, e2021GL093361, 10.1029/2021GL093361, 2021. Available at: https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2021GL093361.

Hu, C., Griffis, T., Frie, A., Baker, J., Wood, J., Millet, D., Yu, Z., **Yu, X.**, and Czarnetzki, A.: A multi-year constraint on ammonia emissions and deposition within the U.S. Corn Belt. *Geophysical Research Letters*, 48, e2020GL090865, 10.1029/2020GL090865, 2021. Available at: https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2020GL090865.

Yu, X., Millet, D. B., Wells, K. C., Griffis, T. J., Chen, X., Baker, J. M., Conley, S. A., Smith, M. L., Gvakharia, A., Kort, E. A., Plant, G., and Wood, J. D.: Top-down constraints on methane point source emissions from animal agriculture and waste based on new airborne measurements in the U.S. Upper Midwest, *Journal of Geophysical Research: Biogeosciences*, 125, e2019JG005429, 10.1029/2019jg005429, 2020. Available at: https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2019JG005429.

Translations

The Atmosphere: An Introduction to Meteorology. By F. K. Lutgens and E. J. Tarbuck (2013). Translation into Chinese by X. Chen, Y. Huang, H. Hui, N. Wang, **X. Yu**, Y. Meng, and S. Chen (2016). Published by Pearson Education Asia Limited and Publishing House of Electronics Industry.

- Translated Chapter 12 *Weather analysis and forecasting*.

Dataset

Millet, D. B., Conley, S. A., Gvakharia, A., Kort, E. A., Plant, G., Smith, M. L., and **Yu, X.**: *Airborne measurements from the GEM study*. Retrieved from the Data Repository for the University of Minnesota, https://doi.org/10.13020/f50r-zh70, 2019. Available at: https://conservancy.umn.edu/handle/11299/208818.

Model Development and Simulation Archive

Yu, X., Millet, D. B., and Henze, D. K.: *Code updates of GEOS-Chem Adjoint v35 for TROPOMI methane 4D-Var inversion*. Retrieved from the Data Repository for the University of Minnesota, https://doi.org/10.13020/g5xc-nj81, 2021. Available at: https://conservancy.umn.edu/handle/11299/222249.

Millet, D. B., Gonzalez, A., and **Yu, X.**: *Gonzalez 2021 tagged CO model archive*. Retrieved from the Data Repository for the University of Minnesota, https://doi.org/10.13020/p2ze-1y93, 2021. Available at: https://conservancy.umn.edu/handle/11299/219382.

Invited Seminars

2024 Environmental Defense Fund
2024 School of City & Regional Planning, Georgia Institute of Technology
2023 Orbio Earth
2023 Scripps Institution of Oceanography, University of California, San Diego
2023 Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado
2023 The State University of New York (SUNY) at Albany
2023 Lamont-Doherty Earth Observatory, Columbia University
2023 Purdue University
2023 University of Wyoming
2023 National Center for Atmospheric Research (NCAR)
2022 Tsinghua University
2022 University of Minnesota
2022 University of Minnesota
2021 Pacific Northwest National Laboratory (PNNL)
2020 National Center for Atmospheric Research (NCAR)
2020 University of Colorado at Boulder

Selected Oral Conference Presentations

2024 Sustainability Data Science Conference, Stanford University
2023 10th Young Scientist Workshop, Nanjing University
2022 AGU 2022 Fall Meeting, Session on remote sensing of CH_4 and CO_2 from space
2022 10th International GEOS-Chem Meeting (Carbon Gases), Washington University at St. Louis
2022 AMS 102nd Annual Meeting, 24th Conference on Atmospheric Chemistry
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2021 AGU 2021 Fall Meeting, Session on remote sensing of CH_4 and CO_2 from space
2021 AGU 2021 Fall Meeting, Session on quantifying air pollutant and greenhouse gas emissions
2021 AMS 101st Annual Meeting, 23rd Conference on Atmospheric Chemistry
2020 1st GEOS-Chem Europe User's Meeting

2020 ACT-America Workshop, Pennsylvania State University
2018 AGU 2018 Fall Meeting, Session on the global methane cycle

Selected Conference Posters

2023 AGU 2023 Fall Meeting, Session on the global methane budget
2023 Stanford Data Science Conference
2021 AMS 5th Conference on Atmospheric Biogeosciences
2020 AGU 2020 Fall Meeting, Session on remote sensing of CH_4 and CO_2 from space
2019 AGU 2019 Fall Meeting, Session on regional budgets, trends, and drivers of greenhouse gases
2019 Frontiers of Atmospheric Science and Chemistry, NCAR
2019 9th International GEOS-Chem Meeting, Harvard University