

ABHISHEK CHATTERJEE

Carbon Cycle and Ecosystems,
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EDUCATION

University of Michigan, Ann Arbor, MI	Environmental Engineering	PhD 2012
University of Michigan, Ann Arbor, MI	Environmental and Water Resources Engineering	MSE 2007
Delhi College of Engineering, New Delhi	Civil and Environmental Engineering	BE 2006

POSITIONS HELD

NASA Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California, US

Project Scientist , Orbiting Carbon Observatory-3	01/2022 – present
Deputy Project Scientist , Orbiting Carbon Observatory-2	01/2022 – present
Scientist , Carbon Cycle and Ecosystems Group	10/2021 – present

- Leading OCO-2 and OCO-3 project and mission teams, including calibration, algorithm, validation, mission planning and science groups and effective communications of project achievements internally and externally to JPL, NASA, and international space agency partners
- Understanding the interactions between climate and the carbon cycle, with specific focus on the response of the carbon cycle to extreme events and disturbances
- Improving accounting of local and urban greenhouse gas emission estimates using space-based observations to support national and sub-national policy and decision-making process
- Developing and implementing Observing System Simulation Experiments (OSSE) to define NASA's next generation of missions for observing greenhouse gases from space

Universities Space Research Association, NASA Goddard Space Flight Center, Maryland, US

Senior Scientist and Group Lead	03/2019 – 09/2021
Scientist	01/2017 – 03/2019
Associate Scientist	01/2015 – 12/2016

- Group lead and managerial duties included enabling interaction between USRA scientists, GMAO and NASA Goddard Earth Sciences division, monitoring compliance and managing resources on the GESTAR cooperative agreement, fostering and mentoring early-career scientists
- Developed and implemented carbon cycle assimilation and predictive modeling capabilities within NASA's GEOS modeling framework to constrain global and regional carbon cycle dynamics
- Studied the linkages between the carbon and the water cycle over 'tipping-point' regions by exploiting the synergy between NASA's remote-sensing missions and field campaigns

CURRICULUM VITAE

A. CHATTERJEE

Postdoctoral Fellow, NOAA Climate and Global Change Program,
National Center for Atmospheric Research, Colorado, US 01/2013 – 12/2014

- Developed a coupled ocean-atmosphere data assimilation system based on the NCAR Community Earth System Model (CESM)
- Developed a framework to evaluate the skill of coupled systems for seasonal-to-interannual MJO predictions

Visiting Investigator, Department of Global Ecology,
Carnegie Institution for Science, California, US 07/2011 – 12/2012

- Developed prototype of a large-scale parallel geostatistical CO₂ data assimilation system for real-time integration of *in situ* and remote sensing CO₂ concentrations (CO2DAAD)

Graduate Student Research Assistant, Environmental and Water Resources,
Department of Civil and Environmental Engineering, University of Michigan,
Ann Arbor, Michigan, US 01/2008 – 12/2012

- Developed geostatistical tools for integrating multi-scale remote sensing data at high spatiotemporal scales

Summer Fellow, Great Lakes Environmental Research Laboratory,
The National Oceanic and Atmospheric Administration (NOAA),
Ann Arbor, Michigan, US 05/2007 - 08/2007

- Developed improved data fusion methods for estimating over-lake precipitation

Intern, Environmental Division, National Productivity Council,
New Delhi, IN 12/2005 - 02/2006

- Developed waste minimization techniques for a medium scale textile processing plant; Carried out water and ETP audit for the same.

Intern, Environmental Internship Program, Environmental Management
Centre, Mumbai, IN 06/2005 - 07/2005

- Developed strategies and a comprehensive toolbox to facilitate waste management and air quality control in industries.

Intern, Biomedical Waste Management, Jaipur Golden Hospital,
New Delhi, IN 06/2004 - 07/2004

- Helped analyze and implement technologies for proper handling and disposal of biomedical waste in the hospital premises.

PROFESSIONAL SERVICE AND MEMBERSHIP

National and International Service

- *Committee Chair and/or Committee Member Roles for AGU and AMS*

- Chair, Charles S. Falkenberg Award Selection Committee, American Geophysical Union (AGU), 2019 - *present*
 - Conference Co-Chair, Conference on Atmospheric Chemistry, AMS Annual Meeting, 2021-2024
 - Member, Committee on Atmospheric Chemistry, Science and Technology Advisory Committee (STAC) to the American Meteorological Society (AMS), 2018 - 2024
 - Member, Atmospheric Sciences Early Career Committee, American Geophysical Union (AGU), 2019 – 2020
- *North American Carbon Program (NACP) and U.S. Global Change Research Program (USGCRP)*
- Co-lead, Third Decadal US Carbon Cycle Science Plan
 - Co-chair, NACP Science Leadership Group
 - Carbon Cycle Interagency Working Group, U.S. Global Change Research Program
 - Principal Investigators Planning Committee, North American Carbon Program, 2015-2017
 - Chapter co-lead, 2nd State of the Carbon Cycle Report (SOCCR-2), “Chapter 19 - *Future of the North American Carbon Cycle*”
 - Chapter coauthor, 2nd State of the Carbon Cycle Report (SOCCR-2), “Chapter 8 – *Atmosphere*”
 - Chapter coauthor, Fifth National Climate Assessment (NCA5), “Chapter 2 – *Climate Trends*”
- *World Meteorological Organization (WMO) and World Climate Research Programme (WCRP)*
- Member, Expert Team on the Atmospheric Composition Network Design and Evolution, Environmental Pollution and Atmospheric Chemistry Scientific Steering Committee (EPAC SSC), WMO
 - Affiliate Member, Safe Landing Climates Lighthouse Activity – Understanding High-Risk Events and Perturbed Carbon Cycle, WCRP
- *NASA Arctic-Boreal Vulnerability Experiment Program (ABoVE)*
- Chair, Carbon Dynamics Working Group, 2017 - 2022
 - Guest Editor, ERL Special Issue/Collection on *Resiliency and Vulnerability of Arctic and Boreal Ecosystems to Environmental Change: Advances and Outcomes of ABoVE*
 - Member, Science Team Planning Committee, 2018 - 2022
- *NASA Carbon Monitoring System (CMS)*
- Chair, Flux and Atmospheric Validation Working Group, 2019 - 2022
 - Guest Editor, ERL Special Issue/Collection on *Carbon Monitoring Systems Research and Applications*
- *Scientific Research Proposal Review Panel Member*
- Department of Energy Office of Science, Office of Biological & Environmental Research (BER) - BGC-Feedbacks Scientific Focus Area and Earth System Model Development and Analysis programs

- European Research Council (ERC) Consolidator Grant
- NOAA Modeling, Analysis, Predictions, and Projections Program, Atmospheric Chemistry, Carbon Cycle and Climate (AC4) Program
- NASA ROSES Carbon Cycle Science Solicitation, Carbon Monitoring System, Terrestrial Ecology and New Investigator Programs
- NASA Earth and Space Science (graduate student) Fellowships

- *Journal Editorial Roles*
 - Editor, Atmospheric Chemistry and Physics (ACP), Copernicus GmbH
 - Associate Editor, Atmospheric Measurement Techniques (AMT), Copernicus GmbH
 - Associate Editor, Data-driven Climate Sciences, Frontiers in Big Data, Frontiers

- *Journal Reviewer*
 - Nature Climate Change, Journal of Geophysical Research (Atmospheres), Journal of Geophysical Research (Biogeosciences), Biogeosciences, Atmospheric Chemistry and Physics, Monthly Weather Review, Atmospheric Measurement Techniques, Geoscientific Model Development, Journal of Applied Meteorology and Climatology, Water Resources Research, Remote Sensing of Environment, IEEE Trans. on Geoscience and Remote Sensing, and Practical Uses of Math and Science (online journal for pre-college education)

- *Session Convener and Chair Duties*
 - American Geophysical Union Fall Meeting
 - *The Resilience and Vulnerability of Arctic and Boreal Ecosystems to Climate Change*, 2017 - present
 - *Constraining Biosphere-Atmosphere Exchange Processes using Remote-sensing and In Situ Observations*, 2011 – present
 - American Meteorological Society Annual Meeting
 - *Greenhouse Gases*, 2015 – present
 - International Boreal Forest Research Association (IBFRA)
 - *Changing Carbon Cycle Dynamics of Boreal Ecosystems*, 2021
 - 17th International Workshop on Greenhouse Gas Measurements from Space, Virtual Meeting, Planning Committee Member, 2021
 - Asia-Oceania Geosciences Annual Meeting
 - *From GHG Observations to Fluxes: Top-Down Measurements of the Carbon Cycle*, 2018
 - North American Carbon Program Meetings
 - 6th NACP Meeting, chaired 3 different sessions - ‘Critical Regions’, ‘Diagnosis of the Carbon Cycle’, & ‘Linking Carbon Cycle Science to Decision Making’, 2017
 - World Weather Open Science Conference
 - Session “Data Assimilation Methodology and Diagnostic Tools”, 2014

- *Judge*
 - *Outstanding Student Paper Awards (OSPA) Program*, AGU Fall Meeting

- *Annual AMS Student Conference, AMS Annual Meeting*

Universities Space Research Association Service

- *GESTAR People Committee, 2015 – 2016*
- *Panel Member, Science Career Panel, Mosaics in Science Career Workshop, National Park Service, 2016*

University Corporation for Atmospheric Research Service

- *Research Mentor, Significant Opportunities in Atmospheric Research and Science (SOARS) Program, Summer 2014*

University of Michigan Service

- *Co-chair, Engineering Graduate Symposium 2009, College of Engineering.*
- *Co-chair, Engineering Departmental Visitation 2009, College of Engineering.*
- *Organizing Committee Member, New Graduate Student Welcome Day 2009, College of Engineering.*
- *I-Connect Graduate Volunteer, Rackham I-Connect Program, 2009-2010, Rackham Graduate School.*
- *Organizer, ASEE Summer Seminar Series 2009 and 2008, U-M chapter of American Society for Engineering and Education (ASEE).*
- *Session Co- Chair, Civil, Environmental and Atmospheric Sciences Session, Engineering Graduate Symposium 2008, College of Engineering.*
- *Member, Student Award (Hugh Rumler Prize) Committee 2008, College of Engineering.*
- *Member, Engineering Departmental Visitation Committee 2008, College of Engineering.*
- *Session Moderator and Organizing Committee Member, New Graduate Student Welcome Day 2008, College of Engineering.*
- *Member, Planning Committee, Energy Day 2007, Michigan Memorial Phoenix Energy Institute.*
- *International Student Mentor, 2007-2009, Rackham Graduate School.*
- *Department of Civil and Environmental Engineering Representative, 2006-2010, College of Engineering Graduate Student Advisory Committee (GSAC), under the Associate Dean for Graduate Education.*
- *Student Leader, Deans' Forum Luncheon 2009, College of Engineering*
- *Student Leader, Communicating with your Advisor Workshop 2008, College of Engineering.*
- *Student Leader, Academic Career in Engineering and Science (ACES) Workshop 2007, College of Engineering.*
- *Student Leader, Fellowship Application Workshop 2007, College of Engineering.*
- *Student Leader, Effective Presentations Workshop 2007, College of Engineering.*

Delhi College of Engineering Service

- *Editor, 'Reverie-the continuum', Delhi College of Engineering Magazine, 2005-2006*
- *Chief Organizer, 'TECHNODROME 2004', Annual Technical Festival of the Department of Civil and Environmental Engineering, 2004*
- *Co-Editor, 'Epicenter', Souvenir of TECHNODROME 2004*

- *Member, Organizing Committee, National Conference on Innovative Approaches in the Management of Environment (IAME), 2003*

Community Service

- *Volunteer and Donor, American Red Cross, 2010-present*
- *Volunteer, Humane Society of Boulder Valley, 2013*
- *Volunteer, Humane Society of Huron Valley, 2009-2011*
- *Volunteer, United Nation Development Programs (UNDP), 2004-2005*

Member

- *American Association for the Advancement of Science (AAAS)*
- *American Geophysical Union (AGU)*
- *European Geosciences Union (EGU)*
- *Asia-Oceania Geosciences Society (AOGS)*
- *American Meteorological Society (AMS)*
- *Society of Industrial and Applied Mathematics (SIAM)*

HONORS AND AWARDS

- *Team Award, Earth Sciences Section, Jet Propulsion Laboratory, 2024*
- *Voyager Award, Earth Sciences Section, Jet Propulsion Laboratory, 2022*
- *NASA Group Achievement Award, ABoVE Airborne Science Campaign, NASA, 2018*
- *NASA Group Achievement Award, OCO-2 Core Science Team, NASA, 2018*
- *GESTAR Excellence Award, Universities Space Research Association, 2018*
- *Outstanding Scientific Contribution by a new GMAO member, NASA Goddard Global Modeling and Assimilation Office, 2017*
- *NOAA Postdoctoral Program in Climate and Global Change Fellowship, University Corporation for Atmospheric Research, 2012 – 2014*
- *AAAS/Science Program for Excellence in Science Recipient, 2012-2014*
- *NASA Earth and Space Science Fellowship, NASA, 2009-2012*
- *Rackham International Student Fellowship, University of Michigan, 2009*
- *Distinguished Leadership Award, College of Engineering, University of Michigan, 2008*
- *Great Lakes Summer Student Fellowship, University of Michigan, 2007*
- *College of Engineering Fellowship, University of Michigan, 2006-2007*
- *Lieutenant Governor's Gold Medal, Delhi University, 2006.*
- *Pandit C. L. Shukla Gold Medal, Delhi University, 2006.*
- *Merit cum Means Scholarship, Delhi College of Engineering, 2003- 2005.*
- *First Place in Life Cycle Analysis Student Paper Competition, 'Vivre-2005', Delhi College of Engineering, 2005*
- *Third Place in National Level Student Technical Paper Competition, 'Tryst-2005', Indian Institute of Technology, 2005*
- *Third Place in National Level Student Technical Paper Competition, 'Papyrus-2004', Delhi College of Engineering, 2004*

RESEARCHERS AND STUDENTS SUPERVISED**Research Advisor**

- Dr. Dustin Roten, Postdoctoral Fellow, NASA Jet Propulsion Laboratory, 2023 – *present*
- Dr. Nima Madani, UCLA / JPL JIFRESSE Fellow, 2023 - *present*
- Dr. Le Kuai, NASA Jet Propulsion Laboratory, 2023 – *present*
- Dr. Sudhanshu Pandey, Research Scientist, NASA Jet Propulsion Laboratory, 2022 - 2023
- Dr. Andrew Feldman, NASA Postdoctoral Program Fellow, Goddard Space Flight Center, co-advisor with Dr. Ben Poulter and Dr. Joanna Joiner, 2021 - 2023
- Dr. Zhen Zhang, University of Maryland, co-advisor with Dr. Ben Poulter, 2017 – 2021
- Dr. Alka Singh, 2019 – 2020 (now faculty at Amrita VV University, India)
- Dr. Tian Yao (now scientist with the Terrestrial Information Systems Laboratory, NASA Goddard Space Flight Center), 2018

Student Research Co-Advisor/Supervisor

- Chiranjit Das, 2024-2025 Fulbright-Kalam Climate Fellow, Ph. D. Candidate, Indian Institute of Technology, Delhi, Thesis Advisor – Dr. Ravi Kunchala
- Martijn Pallandt, Ph.D. Candidate, Max Planck Institute for Biogeochemistry, Jena, Germany, Thesis Advisor – Dr. Mathias Göckede, 2020 – 2021
- Jeralyn Poe, Ph.D. Candidate, Northern Arizona University, Thesis Advisor – Dr. Deborah N. Huntzinger, Summer 2020
- Shannon Reault, MS Graduate Student, Clark University, Summer 2020
- Eugene Cody, Undergraduate Student, Haskell Indian Nations University, Summer 2014
- Christopher Baik, Undergraduate Student, University of Michigan, Ann Arbor, Summer 2010

TEACHING EXPERIENCE**Short Courses Taught*****Summer School for Inverse Modeling of Greenhouse Gases (SSIM-GHG)***

Location: Colorado State University, Fort Collins, CO
 Dates: June 11-21, 2024
 Role: Lecturer for atmospheric greenhouse gas inversions, Ensemble Kalman Filter applications and diagnostic tools for evaluating atmospheric inversions
 Enrollment: 30 students, including graduate students, postdoctoral scholars

Frontiers in Ensemble Data Assimilation for Geophysical Application

Location: National Center for Atmospheric Research, Boulder, CO
 Dates: August 3-7, 2015
 Role: Lecturer for coupled data assimilation
 Enrollment: 24 graduate students

Data Assimilation in Biogeochemical Cycles

Location: Abdus Salam International Center for Theoretical Physics, Trieste, Italy
 Dates: September 21-27, 2014
 Role: Lecturer for atmospheric greenhouse gas inversion and measurement network design using spatial statistics
 Enrollment: 42 graduate students

ASP Summer Colloquium on Carbon-Climate Connections in the Earth System

Location: National Center for Atmospheric Research, Boulder, Colorado
 Dates: August 2, 2013
 Role: Co-Instructor with David Schimel (JPL), Matthew Long (NCAR) and Britton Stephens (NCAR) for tutorial session on atmospheric flux constraints
 Enrollment: 25 graduate students

Workshop on Geostatistical Inverse Modeling

Location: University of Michigan, Ann Arbor, Michigan
 Dates: August 3-6, 2009
 Role: Co-Instructor with Anna Michalak (now at Carnegie/Stanford Univ.) for hands-on session on inverse modeling and geostatistics
 Enrollment: 12 researchers, postdoctoral fellows, and graduate students

Courses Taught at the University of Michigan**CEE 270: Statistical Methods for Data Analysis and Uncertainty Modeling**

Location: University of Michigan, Ann Arbor, Michigan
 Dates: Fall 2008
 Role: Graduate Student Instructor - responsibilities included developing assignments and teaching MINITAB for the laboratory section, holding office hours, grading midterm and final examination papers
 Enrollment: 54 undergraduate students

FUNDING HISTORY***Diagnosing and attributing Arctic-Boreal carbon fluxes using in situ and satellite CO₂ monitoring network***

Principal Investigator, NASA Research Announcement NNH20ZDA001N - OCOST: Science Team for the OCO mission, August 2, 2021, to August 1, 2024

Synthesis, Reconciliation and Assessment of CMS Prototype Products

Principal Investigator, NASA Research Announcement NNH18ZDA001N - Carbon Monitoring System (CMS): Continuing Prototype Product Development, November 1, 2019, to October 31, 2023

GEOS-5 Forecasting and Modeling in support of ABoVE airborne research

Principal Investigator, NASA Research Announcement NNH16ZDA001N-TE Terrestrial Ecology: An Airborne Campaign for the Arctic-Boreal Vulnerability Experiment (ABoVE), January 1, 2017, to December 31, 2022

Observing and validating carbon-climate feedbacks with OCO-2

Co-Investigator (PI David Schimel, JPL), NASA Research Announcement NNH17ZDA001N – OCO₂ Science Team for the OCO Missions, April 1, 2018, to March 31, 2021

Integrating remote sensing observations with NASA's GEOS-5 modeling framework in support of retrospective analyses and seasonal prediction of biosphere-atmosphere CO₂ flux

Co-Investigator (PI Lesley Ott, GSFC), NASA Research Announcement NNH16ZDA001N-IDS: Interdisciplinary Science, September 1, 2017, to August 31, 2021

Use of SMAP observations in Conjunction with OCO-2 data to Improve Understanding of Coupled Carbon and Water Cycle within the GEOS-5 Modeling System

Principal Investigator, NASA Research Announcement NNH15ZDA001N-SUSMAP - Science Utilization of the Soil Moisture Active Passive Mission, September 1, 2016, to August 31, 2020

GEOS-Carb III: Delivering mature carbon flux and concentration datasets in support of NASA's Carbon Monitoring System

Co-Investigator (PI Lesley Ott, GSFC), NASA Research Announcement NNH16ZDA001N-CMS: Carbon Monitoring System, September 1, 2017, to August 31, 2020

Operations and data products for carbon-climate feedbacks using OCO-2

Co-Investigator (PI Dave Schimel, JPL), NASA Research Announcement NNH14ZDA001N - Science Team for the OCO-2 Mission, April 1, 2015, to March 31, 2018

Carbon Flux Attribution through an Innovative Multi-Species Carbon Data Assimilation System

Principal Investigator, UCAR Visiting Scientist Programs, NOAA Postdoctoral Program in Climate & Global Change, University Corporation for Atmospheric Research (UCAR), January 1, 2013, to December 31, 2014

Geostatistical Data Assimilation for Atmospheric CO₂

Student Principal Investigator, with N. G. Love (PI, U. Michigan), A. M. Michalak (Science PI, CIS/Stanford Univ.), NASA Earth and Space Science Fellowship Program, National Aeronautics and Space Administration (NASA), September 1, 2009, to August 31, 2012

Spatiotemporal Mapping of Global CO₂ from the Orbiting Carbon Observatory

Student Principal Investigator, with A. M. Michalak (PI, U. Michigan/CIS/Stanford Univ.), Rackham International Student Fellowship, Rackham Graduate School, University of Michigan, May 1, 2008, to August 31, 2008

Improving Estimation of Overlake Precipitation in Lake Erie

Student Principal Investigator, with C. DeMarchi (PI, NOAA-GLERL/Case Western Univ.), A. M. Michalak (Co-I, U. Michigan/CIS/Stanford Univ.), Great Lakes Summer Student Fellowship, Cooperative Institute for Limnology and Ecosystems Research (CILER), University of Michigan, May 1, 2007, to August 31, 2007

PUBLICATIONS

In Review or In Preparation for submission by Spring 2024 (copies available upon request)

1. Ahn, D. *et al.* (in review) Regional and Socioeconomic Characteristics in C40 cities' CO₂ Emissions Revealed from Space, *Nature Cities*
2. Virkkala, A. *et al.* (in review) An increasing Arctic-Boreal CO₂ sink despite strong regional sources, *Nature Climate Change*
3. Byrne, B. *et al.* (in review) Unprecedented Canadian forest fire carbon emissions during 2023, *Nature*
4. Feldman, A. *et al.* (in review) Less frequent but more intense rainfall events as a driver of major shifts in global vegetation, *Nature*
5. Liu, Z. *et al.* (in review) Drivers and trends of enhanced seasonal CO₂ amplitude in northern high latitudes, *Nature Reviews Earth & Environment*
6. Madani, N. *et al.* (in review) A machine learning approach to produce a continuous solar-induced chlorophyll fluorescence dataset for understanding Ocean productivity, *Journal of Geophysical Research - Machine Learning and Computation*
7. Zhu, X. *et al.* (in review) A synthesized field survey database of vegetation and active layer properties for the Alaskan tundra (1972-2020), *Earth System Science Data*
8. Hugelius, G. *et al.* (in review) Two decades of permafrost region CO₂, CH₄, and N₂O budgets suggest a small net greenhouse gas source to the atmosphere, *Global Biogeochemical Cycles*
9. Goetz, S. *et al.* (in review) An overview of NASA's Arctic Boreal Vulnerability Experiment (ABOVE): Development, implementation, advances and knowledge gaps, *Environmental Research Letters ABOVE Special Collection*
10. Pandey, S. *et al.* (in review) Towards Low-Latency Estimation of Atmospheric CO₂ Growth Rates using Satellite Observations: Evaluating Sampling Errors of Satellite and In Situ Observing Approaches, *AGU Advances*
11. Poulter, B. *et al.* (in preparation) The North American Greenhouse Gas Budget: emissions, removals, and integration for CO₂, CH₄, and N₂O (2010-2019): Results from the Second Regional Carbon Cycle and Processes Study (RECCAP2)
12. Chatterjee, A. *et al.* (in preparation) Decadal Carbon Budget of the North American Arctic and Boreal Ecosystems

Published

1. Treat, C. *et al.* (2024) Permafrost carbon: progress on understanding controls, stocks, and fluxes across northern terrestrial ecosystems, *Journal of Geophysical Research – Biogeosciences*, doi: 10.1029/2023JG007638
2. Jacobs, N. *et al.* (2024) The importance of digital elevation model accuracy in XCO₂ retrievals: improving the OCO-2 ACOS v11 product, *Atmospheric Measurement Techniques*, doi: 10.5194/amt-17-1375-2024
3. Murray-Tortarolo, G. *et al.* (2024) A Greenhouse Gas Budget for Mexico during 2000-2019, *Journal of Geophysical Research – Biogeosciences*, doi: 10.1029/2023JG007667
4. Gaubert, B. *et al.* (2023) Neutral tropical African CO₂ exchange estimated from aircraft and satellite observations, *Global Biogeochemical Cycles*, doi: 10.1029/2023GB007804

5. Marvel, K. *et al.* (2023) Ch. 2. Climate trends. In: ***Fifth National Climate Assessment***. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. doi:10.7930/NCA5.2023.CH2
6. Taylor, T. E. *et al.* (2023) Evaluating the consistency between OCO-2 and OCO-3 XCO₂ estimates derived from the NASA ACOS version 10 retrieval algorithm, ***Atmospheric Measurement Techniques***, 16, 3173–3209, doi:10.5194/amt-16-3173-2023
7. Feldman, A. *et al.* (2023) A multi-satellite framework to rapidly evaluate extreme biosphere cascades: The Western US 2021 drought and heatwave, ***Global Change Biology***, doi: 10.1111/gcb.16725
8. Ramonet, M., A. Chatterjee, *et al.* (2023), CO₂ in the Atmosphere, Growth and Trends Since 1850, ***Oxford Research Encyclopedia of Climate Science***, Oxford University Press, doi:10.1093/acrefore/9780190228620.013.863
9. Feldman, A. *et al.* (2023) Remotely sensed soil moisture can capture dynamics relevant to plant water uptake, ***Water Resources Research***, doi:10.1029/2022WR033814
10. Byrne, B. *et al.* (2023) National CO₂ budgets (2015–2020) inferred from atmospheric CO₂ observations in support of the Global Stocktake, ***Earth System Science Data***, doi: 10.5194/essd-2022-213
11. Feldman, A. *et al.* (2023) Using OCO-2 column CO₂ retrievals to rapidly detect and estimate biospheric surface carbon flux anomalies, ***Atmospheric Chemistry and Physics***, doi: 10.5194/acp-23-1545-2023
12. Nassar, R. *et al.* (2022) Tracking CO₂ emission reductions from space: A case study at Europe’s largest fossil fuel power plant, ***Frontiers in Remote Sensing***, doi: 10.3389/frsen.2022.1028240
13. Hurtt, G. *et al.* (2022) The NASA Carbon Monitoring System Phase 2 Synthesis: Scope, Findings, Gaps and Recommended Next Steps, ***Environmental Research Letters***, doi: 10.1088/1748-9326/ac7407
14. Keller, G. R. *et al.* (2022) Inflight Radiometric Calibration and Performance of the Orbiting Carbon Observatory 3 (OCO-3) for Version 10 Products, ***IEEE Transactions on Geoscience and Remote Sensing***, vol. 60, pp. 1-18, 2022, Art no. 5413518, doi: 10.1109/TGRS.2022.3216825
15. Murray-Tartorolo, G. *et al.* (2022) A process-model perspective on recent changes in the carbon cycle of North America, ***Journal of Geophysical Research – Biogeosciences***, 127, e2022JG006904, doi: 10.1029/2022JG006904
16. Byrne, B. *et al.* (2022) Multiyear observations reveal a larger than expected autumn respiration signal across northeast Eurasia, ***Biogeosciences***, doi: 10.5194/bg-2022-40
17. Zhang, Z., A. Chatterjee *et al.* (2022) Effect of Assimilating SMAP Soil Moisture on CO₂ and CH₄ Fluxes through Direct Insertion in a Land Surface Model, ***Remote Sensing***, 14(10), doi: doi.org/10.3390/rs14102405
18. Ma, L. *et al.* (2022) Global Evaluation of the Ecosystem Demography Model (ED v3.0), ***Geoscientific Model Development***, doi:10.5194/gmd-2021-292
19. Taylor, T. *et al.* (2022) An 11-year record of GOSAT XCO₂ measurements from the NASA ACOS build 9 retrieval algorithms: bias correction against TCCON and models, and comparison to OCO₂, ***Earth System Science Data***, 14, 325–360, doi:10.5194/essd-14-325-2022
20. Lovenduski, N., A. Chatterjee *et al.* (2021) On the detection of COVID driven changes in atmospheric CO₂, ***Geophysical Research Letters***, doi: 10.1029/2021GL095396
21. Zhang, Z. *et al.* (2021) Anthropogenic emission is the main contribution to the rise of atmospheric methane during 1993-2017, ***National Science Reviews***, doi:10.1093/nsr/nwab200

22. Laughner, J. *et al.* (2021) Societal shifts due to COVID-19 reveal large scale complexities and feedbacks between atmospheric chemistry and climate change, *Proceedings of the National Academy of Sciences of the United States of America*, doi: 10.1073/pnas.2109481118
23. Weir, B. *et al.* (2021) Regional impacts of COVID-19 on carbon dioxide detected from space, *Science Advances*, doi: 10.1126/sciadv.abf9415
24. Sweeney, C., A. Chatterjee *et al.* (2021), Atmospheric carbon cycle dynamics over the ABoVE domain: an integrated analysis using aircraft observations (Arctic-CAP) and model simulations (GEOS), *Atmospheric Chemistry and Physics*, doi: 10.5194/acp-2020-609
25. Madani, N., *et al.* (2021), The impacts of climate and wildfire on ecosystem Gross Primary Productivity in Alaska, *Journal of Geophysical Research – Biogeosciences*, doi: 10.1029/2020JG006078
26. Weir, B. *et al.* (2021), Calibrating satellite-derived carbon fluxes for retrospective and near real-time assimilation systems, *Atmospheric Chemistry and Physics*, doi:10.5194/acp-2020-496
27. Bruhwiler, L. *et al.* (2021) Observations of greenhouse gases as climate indicators, *Climatic Change*, 165 (12), doi: 10.1007/s10584-021-03001-7
28. Crowell, S. *et al.* (2019) The 2015–2016 carbon cycle as seen from OCO-2 and the global in situ network, *Atmospheric Chemistry and Physics*, 19, 9797–9831, doi:10.5194/acp-19-9797-2019
29. Huntzinger, D. N., A. Chatterjee *et al.* (2018) "Chapter 19: Future of the North American Carbon Cycle." In *Second State of the Carbon Cycle Report*, doi:10.7930/soccr2. 2018.ch19
30. Jacobson, A. R. *et al.* (2018) "Chapter 8: Observations of Atmospheric Carbon Dioxide and Methane. " In *Second State of the Carbon Cycle Report*, doi: 10.7930/soccr2.2018.ch8
31. Zhang, Z. *et al.* (2018), Enhanced response of global wetland methane emissions to recent El Niño-Southern Oscillation events, *Environmental Research Letters*, 13(7), doi:10.1088/1748-9326/aac939
32. Fisher, J. B. *et al.* (2018), Missing pieces to modeling the Arctic-Boreal puzzle, *Environmental Research Letters*, 13(2), 020202, doi: 10.1088/1748-9326/aa9d9a
33. Chatterjee, A., *et al.* (2017), Influence of El Niño on atmospheric CO₂ over the tropical Pacific Ocean: findings from NASA's OCO-2 mission, *Science*, 358 (6360), doi: 10.1126/science.aam5776
34. Eldering, A., *et al.* (2017), Evaluation of the flux of carbon dioxide to and from the atmosphere: The Orbiting Carbon Observatory-2 Early Science Investigations, *Science*, 358 (6360), doi: 10.1126/science. aam5745
35. Patra, P., *et al.* (2017), Orbiting carbon observatory (OCO-2) tracks 2-3 peta-grams increase of carbon release to the atmosphere during the 2014-2016 El Niño, *Scientific Reports – Nature*, 7, doi:10.1038/s41598-017-13459-0
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39. Chatterjee, A., *et al.* (2010), "A geostatistical data fusion technique for merging remote-sensing and ground-based observations of aerosol optical thickness", *Journal of Geophysical Research – Atmospheres*, 115, D20207, doi:10.1029/2009JD013765

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Non-Peer Reviewed Technical Reports, Op-Eds, and Book Chapters

1. Ott, L., and A. Chatterjee (2022) Earth System Perspective (Chapter 15), in *Regional Greenhouse Gases*, Springer Publications
2. Chatterjee, A., B. Collins, D. Crisp, A. Majumdar (2021) How we can better predict weather catastrophes? *The New York Times Opinion*, Feb. 25, 2021
3. Yueh, S. *et al.* (2019), Joint NASA-ESA Cryosphere-Ocean-Land-Ecosystems CIMR Science Workshop: An Assessment Report, Available at <https://cimr.eu/node/90>
4. Schimel, D. *et al.* (2016), Observing the Carbon-Climate System, Available at <https://arxiv.org/abs/1604.02106>
5. Schimel, D. *et al.* (2015), The Carbon-Climate System, RFI submitted in response to the 2017-2027 NRC Decadal Survey on Earth Science and Applications from Space, Available at http://sites.nationalacademies.org/DEPS/esas2017/DEPS_170397
6. Duncan, B. *et al.* (2015), Long-term, Global, and Space-Based Constraints on Methane’s Emissions and the Factors that Control Them, RFI submitted in response to the 2017-2027 NRC Decadal Survey on Earth Science and Applications from Space, Available at http://sites.nationalacademies.org/DEPS/esas2017/DEPS_170397
7. Jucks, K. *et al.* (2015) Active Sensing of CO₂ Emissions over Nights, Days, and Seasons (ASCENDS) Mission Science Mission Definition Study, Available at: http://cce.nasa.gov/ascends_2015/index.html

Conference Presentations

1. Roten, D. *et al.* (2023) How Well do OCO-2 and OCO-3 Monitor the United States? Implications for Current and Future Space-based Carbon-observing Systems, AGU Fall Meeting, San Francisco, December 11th – 15th, 2023
2. Pierrat, Z. *et al.* (2023) Exploring Diurnal and Seasonal Dynamics of Water Use Efficiency Using Solar Induced Chlorophyll Fluorescence and Thermal Infrared Radiation, AGU Fall Meeting, San Francisco, December 11th – 15th, 2023
3. Feldman, A. *et al.* (2023), A multi-satellite framework to rapidly evaluate extreme biosphere cascades: the Western US 2021 drought and heatwave, AGU Fall Meeting, San Francisco, December 11th – 15th, 2023
4. Chatterjee, A. *et al.* (2023) Observing carbon flux anomalies at space and time scales of extreme climate events: design, measurement, and science requirements for the Next Generation Orbiting Carbon Observatory (OCO-neXt), AGU Fall Meeting, San Francisco, December 11th – 15th, 2023
5. Miller, C. E. *et al.* (2023), The Next Generation Orbiting Carbon Observatory (OCO-neXt), AGU Fall Meeting, San Francisco, December 11th – 15th, 2023
6. Kiel, M. *et al.* (2023) How well does OCO-2 capture the Seasonal Cycle of Carbon Dioxide?, AGU Fall Meeting, San Francisco, December 11th – 15th, 2023

7. Liu, J. *et al.* (2023) Recent Achievements and Challenges in Quantifying CO₂ Natural Carbon Fluxes with Orbiting Carbon Observatory Missions, AGU Fall Meeting, San Francisco, December 11th – 15th, 2023
8. Pandey, S. *et al.* (2023) Harnessing CNNs for Automated Monitoring of CO₂ Point Sources: A Study Using OCO-3, TROPOMI, GEMS, and Bottom-Up Data to Estimate Emissions from an Indian Power Plant Cluster, AGU Fall Meeting, San Francisco, December 11th – 15th, 2023
9. Madani, N. *et al.* (2023) Influence of climate on Arctic ecosystems extends far beyond inter-annual variability in productivity: A SIF data record analysis, AGU Fall Meeting, San Francisco, December 11th – 15th, 2023
10. Bloom, A. A. *et al.* (2023) Leveraging the satellite record with Bayesian inference to advance knowledge of terrestrial carbon cycle feedbacks in a changing world, AGU Fall Meeting, San Francisco, December 11th – 15th, 2023
11. Parazoo, N. *et al.* (2023) The Net Effect of Flash Droughts on the Carbon Cycle, AGU Fall Meeting, San Francisco, December 11th – 15th, 2023
12. Hausfather, Z. *et al.* (2023) Chapter 02 - Climate Trends - The Fifth National Climate Assessment, AGU Fall Meeting, San Francisco, December 11th – 15th, 2023
13. Kurosu, T. *et al.* (2023) Near-Simultaneous Observations of XCO₂ and NO₂ Over Megacities from OCO-3 and GEMS, AGU Fall Meeting, San Francisco, December 11th – 15th, 2023
14. Feldman, A. *et al.* (2023) Remotely sensed soil moisture can capture dynamics relevant to plant water uptake, AGU Fall Meeting, San Francisco, December 11th – 15th, 2023
15. Chatterjee, A. *et al.* (2023), The Orbiting Carbon Observatory missions, CEOS AC-VC-19 / ACSG Joint Meeting, Brussels, October 24th – 27th, 2023.
16. Chatterjee, A. *et al.* (2023), Monitoring anthropogenic CO₂ emissions – NASA’s Orbiting Carbon Observatory-3 mission, ISSRDC, Seattle, July 31st – August 3rd, 2023
17. Chatterjee, A. *et al.* (2023), Monitoring urban CO₂ emissions from space: insights from NASA’s Orbiting Carbon Observatory-3 (OCO-3) mission, IWGGMS-19, Paris, July 4th – 7th, 2023
18. Chatterjee, A. *et al.* (2022), Monitoring urban CO₂ emissions from space: insights from NASA’s Orbiting Carbon Observatory-3 (OCO-3) mission, AGU Fall Meeting, Chicago, December 12th – 16th, 2022
19. Poulter, B. *et al.* (2022) The Greenhouse Gas Budget of North America 2010-2019: Results from the Second Regional Carbon Cycle and Processes study (RECCAP2), AGU Fall Meeting, Chicago, December 12th – 16th, 2022
20. Poe, J. *et al.* (2022) Benchmarking land surface models in the Arctic-Boreal region, AGU Fall Meeting, Chicago, December 12th – 16th, 2022
21. Pandey, S. *et al.* (2022) Investigation of Carbon Dioxide Emissions from a cluster of Power Plants using OCO-3 SAM data, AGU Fall Meeting, Chicago, December 12th – 16th, 2022
22. Feldman, A. *et al.* (2022) Observed Global Photosynthesis Response to Changing Rainfall Frequency and Intensity: Contrasting Dryland and Humid Ecosystem Responses, AGU Fall Meeting, Chicago, December 12th – 16th, 2022
23. Eldering, A. *et al.* (2022) The Contribution of Satellite Measurements to CMS and a Look Forward, AGU Fall Meeting, Chicago, December 12th – 16th, 2022
24. Bell, E. *et al.* (2022) Investigating Small Area XCO₂ Biases Related to Albedo Heterogeneity in OCO-3 Snapshot Area Mapping Mode, AGU Fall Meeting, Chicago, December 12th – 16th, 2022
25. Jacobs, N. *et al.* (2022) Evaluating Recent Changes in Surface Elevation Models and Their Implications for the OCO-2 Bias Correction Over Northern High Latitude Regions, AGU Fall Meeting, Chicago, December 12th – 16th, 2022

26. Kiel, M. *et al.* (2022) Evaluation of the OCO-2 and OCO-3 ACOS Data Products against TCCON, AGU Fall Meeting, Chicago, December 12th – 16th, 2022
27. Nassar, R. *et al.* (2022) Quantifying Facility-Scale CO₂ Emissions using OCO-2 and OCO-3, AGU Fall Meeting, Chicago, December 12th – 16th, 2022
28. O'Dell, C. *et al.* (2022) Evaluation of OCO-2 XCO₂ from the ACOS Version 11 Algorithm, AGU Fall Meeting, Chicago, December 12th – 16th, 2022
29. Liu, J. *et al.* (2022) The state of global carbon cycle in 2020 and 2021, AGU Fall Meeting, Chicago, December 12th – 16th, 2022
30. Kurosu, T. *et al.* (2022) Near-Simultaneous Observations of XCO₂, NO₂, and SO₂ Over Megacities and Volcanoes From OCO-3 and GEMS, AGU Fall Meeting, Chicago, December 12th – 16th, 2022
31. Chatterjee, A. *et al.* (2022) Monitoring anthropogenic emissions from space: insights from OCO-3's Snapshot Area Mapping (SAM) mode, IWGGMS-18, July 12th-14th, 2022
32. Feldman, A. *et al.* (2022) Global Photosynthesis Response to Rainfall Frequency and Intensity, Ecological Society of America Annual Meeting, August 14th – 19th, 2022
33. Zhang, Z. *et al.* (2022), Improving measurements and models of non-growing season Arctic methane emissions, ESA Living Planet Symposium, May 23rd – 27th, 2022
34. Chatterjee, A. *et al.* (2022), OCO-3 Mission Status, Scientific Findings, and Plans for the Final Year, ESA Living Planet Symposium, May 23rd – 27th, 2022
35. Byrne, B. *et al.* (2021) Top-down estimate of carbon stock changes in support of the Global Stocktake, AGU Fall Meeting, New Orleans, LA, December 13th – 17th, 2021
36. Abshire, J. *et al.* (2021) New Approach for a Combined Active/Passive Greenhouse Gas Mission, AGU Fall Meeting, New Orleans, LA, December 13th – 17th, 2021
37. Eldering, A. *et al.* (2021) OCO-3 Mission Status, Scientific Findings, and Plans for the Final Year, AGU Fall Meeting, New Orleans, LA, December 13th – 17th, 2021
38. Yoseph, E. *et al.* (2021) Arctic Tundra Fires Promote Greater Methane Hotspot Occurrence in the Yukon-Kuskokwim Delta, Alaska, USA, AGU Fall Meeting, New Orleans, LA, December 13th – 17th, 2021
39. Ma, L. *et al.* (2021) Prototype global forest aboveground carbon monitoring system with process-based model and spaceborne lidar and optical observations, AGU Fall Meeting, New Orleans, LA, December 13th – 17th, 2021
40. Byrne, B. *et al.* (2021) Large early cold season heterotrophic respiration signal across northern Eurasia, AGU Fall Meeting, New Orleans, LA, December 13th – 17th, 2021
41. Pallandt, M. *et al.* (2021) Assessing Arctic Atmospheric Methane Monitoring by Comparing Satellite Missions to In Situ Observations, AGU Fall Meeting, New Orleans, LA, December 13th – 17th, 2021
42. Chatterjee, A. *et al.* (2021), How will future satellite missions advance diagnosis and attribution of the North American carbon cycle? 7th NACP Open Science Meeting, March 2021
43. Michalak, A. *et al.* (2021), Using atmospheric observations to assess drivers of terrestrial carbon flux variability across scales, 7th NACP Open Science Meeting, March 2021
44. Ott, L. *et al.* (2021), From minutes to seasons: an overview of predictions of carbon flux and concentrations over North America, 7th NACP Open Science Meeting, March 2021
45. Chatterjee, A. *et al.* (2020), Constraining carbon cycle dynamics over the ABoVE domain using in situ and space-based CO₂ observations, AGU Fall Meeting, San Francisco, CA, December 1st – 17th, 2020

46. Crisp, D. *et al.* (2020), Observing the Carbon Cycle with the Greenhouse gases Observing SATellite (GOSAT) and the Orbiting Carbon Observatory-2 (OCO-2), AGU Fall Meeting, San Francisco, CA, December 1st – 17th, 2020
47. Poulter, B. *et al.* (2020), Converging science and policy-based greenhouse gas budgets for North America for the Second Regional Carbon Cycle and Processes Study (RECCAP-2), AGU Fall Meeting, San Francisco, CA, December 1st – 17th, 2020
48. Ott, L. *et al.* (2020), How will future satellite missions inform our understanding of the processes controlling atmospheric carbon.?, AGU Fall Meeting, San Francisco, CA, December 1st – 17th, 2020
49. Pallandt, M. *et al.* (2020), Optimizing the design of the Arctic GHG monitoring network using synthetic data experiments.?, AGU Fall Meeting, San Francisco, CA, December 1st – 17th, 2020
50. Poe, J. *et al.* (2020), Performance of Carbon Flux Models Across the ABoVE Domain Using Eddy Covariance Measurements, AGU Fall Meeting, San Francisco, CA, December 1st – 17th, 2020
51. Yoseph, E. *et al.* (2020), The Influence of Arctic Tundra Fires on Methane Hotspot Distribution in the Yukon-Kuskokwim Delta, Alaska, AGU Fall Meeting, San Francisco, CA, December 1st – 17th, 2020
52. Reault, S. *et al.* (2020), Methane Emissions in the North Slope: Identifying the Source of Model and Observation Disagreement, AGU Fall Meeting, San Francisco, CA, December 1st – 17th, 2020
53. Schiferl, L. *et al.* (2020), Synthesis of Arctic-Boreal region biogenic methane fluxes, model-data mismatch and knowledge gaps, AGU Fall Meeting, San Francisco, CA, December 1st – 17th, 2020
54. Ott, L. *et al.* (2020), Tracking 2020 decreases in carbon dioxide due to the COVID19 pandemic in NASA's GEOS modeling system: implications for space-based carbon monitoring, AGU Fall Meeting, San Francisco, CA, December 1st – 17th, 2020
55. Weir, B. *et al.* (2020), Decreases in 2020 carbon dioxide growth due to the Coronavirus pandemic observed from space, AGU Fall Meeting, San Francisco, CA, December 1st – 17th, 2020
56. Singh, A. *et al.* (2020), Improved Forest Fire Danger Index estimate using SMAP soil moisture, AGU Fall Meeting, San Francisco, CA, December 1st – 17th, 2020
57. Ott, L. *et al.* (2020), Toward integrated seasonal predictions of land and ocean carbon flux: lessons learned from NASA's subseasonal-to-seasonal predictions, AGU Fall Meeting, San Francisco, CA, December 1st – 17th, 2020
58. Chatterjee, A. and B. Poulter (2020), Towards quantifying and understanding the Arctic-Boreal methane cycle from space-based assets, Arctic Methane and Permafrost Challenge (AMPAC) – a NASA-ESA initiative, 2020 European Polar Science Week Conference, October 27th
59. Chatterjee, A. *et al.* (2020), Atmospheric Inverse Models: bridging spatial and temporal scales for Arctic-Boreal carbon flux estimation, Arctic-Boreal Carbon Flux Upscaling Workshop, Woodwell Climate Research Center, October 13th
60. Chatterjee, A. *et al.* (2020), Atmospheric Methane Attributes from a Decade-Long, Global, High-Resolution GEOS Simulation: Trends in Inter- and Intra-Annual Variability, 100th AMS Annual Meeting, Boston, MA, January 12th – 16th
61. Chatterjee, A. *et al.* (2019), Characteristics of total column CO₂ retrievals from the Orbiting Carbon Observatory missions: biases, information content and implications for flux inversions, 2019 AGU Fall Meeting, San Francisco, CA, December 9th - 13th
62. Ott, L. *et al.* (2019), Understanding the influence of biogenic carbon in world cities: Implications for emissions attribution, 2019 AGU Fall Meeting, San Francisco, CA, December 9th - 13th

63. Singh, A. *et al.* (2019), Improved understanding of terrestrial water-carbon linkages using satellite soil moisture and a dynamic global vegetation model, 2019 AGU Fall Meeting, San Francisco, CA, December 9th - 13th
64. Crowell, S. *et al.* (2019), Improved Regional CO₂ Flux Estimates from OCO-2 v9 Retrievals, 2019 AGU Fall Meeting, San Francisco, CA, December 9th - 13th
65. Ott, L. *et al.* (2019), A prototype for monitoring carbon flux anomalies in near real time using NASA's GEOS system, 2019 AGU Fall Meeting, San Francisco, CA, December 9th - 13th
66. Balashov, N. *et al.* (2019), Novel Application of NASA's GEOS-CF CO₂ Forecasting System to ACT-America Airborne Campaign, 2019 AGU Fall Meeting, San Francisco, CA, December 9th - 13th
67. Chatterjee, A. *et al.* (2019), Observing carbon-climate feedbacks in the Arctic: an OSSE initiative to inform current and future greenhouse gas monitoring strategies, AGU Chapman Conference, San Diego, CA, August 26th - 29th.
68. Chatterjee, A. *et al.* (2018), Future of the North American Carbon Cycle, Abstract B43C-19, presented at 2018 AGU Fall Meeting, Washington, D.C., December 10th - 15th.
69. Weir, B. *et al.* (2018), Improving GEOS atmospheric carbon dioxide simulations by calibrating CASA surface fluxes with an empirical sink, Abstract B21J-2471, presented at 2018 AGU Fall Meeting, Washington, D.C., December 10th - 15th.
70. Ott, L. *et al.* (2018), Toward integrated seasonal predictions of land and ocean carbon flux: lessons from the 2015-16 El Niño, Abstract B51E-1990, presented at 2018 AGU Fall Meeting, Washington, D.C., December 10th - 15th.
71. Chatterjee, A. *et al.* (2018), The 2015-2016 El Niño and the response of the carbon cycle: Findings from the Orbiting Carbon Observatory-2 (OCO-2) mission, 15th Annual Meeting of Asia Oceanic Geosciences Society, Honolulu, HI, June 3rd - 8th.
72. Kawa, S. R. *et al.* (2018), The Potential for CO₂ Measurements from Space Using Lidar, 15th Annual Meeting of Asia Oceanic Geosciences Society, Honolulu, HI, June 3rd - 8th.
73. McKain, K. *et al.* (2018), Constraints on Southern Ocean CO₂ Fluxes and Seasonality from Atmospheric Vertical Gradients Observed on Multiple Airborne Campaigns, Abstract 11.4, 20th Conference on Atmospheric Chemistry, American Meteorological Society 98th Annual Meeting, Austin, TX, January 6th - 11th.
74. Pawson, S. *et al.* (2018), Year-to-Year Changes in the Earth System: A Study of the Carbon Cycle using NASA Observations and the GEOS Model, Abstract 14C.2, Piers Sellers' Legacy - Part I, American Meteorological Society 98th Annual Meeting, Austin, TX, January 6th - 11th.
75. Ott, L. *et al.* (2017), NASA's Carbon Cycle OSSE Initiative - Informing future space-based observing strategies through advanced modeling and data assimilations, Abstract GC51C-0817, presented at 2017 Fall Meeting, AGU, New Orleans, LA, December 11th - 15th.
76. Chatterjee, A. *et al.* (2017), The 2015-2016 El Niño and the response of the carbon cycle, Abstract GC14A-03, presented at 2017 Fall Meeting, AGU, New Orleans, LA, December 11th - 15th.
77. Weir, B. *et al.* (2017), An 8-year, high-resolution reanalysis of atmospheric carbon dioxide mixing ratios based on OCO-2 and GOSAT-ACOS retrievals, Abstract A33G-2451, presented at 2017 Fall Meeting, AGU, New Orleans, LA, December 11th - 15th.
78. Poulter, B. *et al.* (2017), Enabling teleconnection-based seasonal forecasts of global terrestrial carbon cycle dynamics, 10th International Carbon Dioxide Conference (ICDC), Interlaken, Switzerland, August 21st-25th.

79. Feely, R. A. *et al.* (2017), Large-scale changes in sea-air CO₂ fluxes in the tropical and subtropical Pacific during the strong 2015-2016 El Niño event, 10th International Carbon Dioxide Conference (ICDC), Interlaken, Switzerland, August 21st-25th.
80. Davis, K. *et al.* (2017), A sustained airborne campaign to improve inverse flux estimates of greenhouse gas sources and sinks: Results from the Atmospheric Carbon and Transport (ACT) – America mission, 10th International Carbon Dioxide Conference (ICDC), Interlaken, Switzerland, August 21st-25th.
81. Schimel, D. *et al.* (2017) Observing carbon cycle climate feedbacks from space, 10th International Carbon Dioxide Conference (ICDC), Interlaken, Switzerland, August 21st-25th.
82. Chatterjee, A. *et al.* (2017), Influence of El Niño on atmospheric CO₂ over the tropical Pacific Ocean, 10th International Carbon Dioxide Conference (ICDC), Interlaken, Switzerland, August 21st-25th.
83. Ott, L. *et al.* (2017), Closing the budget on uncertainty in atmospheric CO₂ simulations using NASA's GEOS modeling system, 10th International Carbon Dioxide Conference (ICDC), Interlaken, Switzerland, August 21st-25th.
84. Patra, P. *et al.* (2017), Anomalies in terrestrial carbon fluxes as derived from the Orbiting Carbon Observatory (OCO-2) in near-real time, 10th International Carbon Dioxide Conference (ICDC), Interlaken, Switzerland, August 21st-25th.
85. Crisp, D. *et al.* (2017), Space-based observations of XCO₂ and SIF from the NASA OCO-2 Mission: A Progress Report, 10th International Carbon Dioxide Conference (ICDC), Interlaken, Switzerland, August 21st-25th.
86. Lauvaux, T. *et al.* (2017), Catching butterflies with fishing nets: Are atmospheric greenhouse gas models adapted to current and future observing systems? 10th International Carbon Dioxide Conference (ICDC), Interlaken, Switzerland, August 21st-25th.
87. Kawa, S. R. *et al.* (2017), Updated Global Error Characterization for a CO₂ Lidar Space Mission, 13th International Workshop on Greenhouse Gas Measurements from Space (IWGGMS), Helsinki, Finland, June 6th-8th.
88. Weir, B. *et al.* (2017), Disentangling GEOS model biases from those of retrieved column carbon dioxide, 13th International Workshop on Greenhouse Gas Measurements from Space (IWGGMS), Helsinki, Finland, June 6th-8th.
89. Ott, L. *et al.* (2017), NASA's Carbon Cycle OSSE Initiative – Informing future space- based observing strategies through advanced modeling and data assimilation, 13th International Workshop on Greenhouse Gas Measurements from Space (IWGGMS), Helsinki, Finland, June 6th-8th.
90. Chatterjee, A. *et al.* (2017), NASA's GEOS-Carb modeling and assimilation system in support of the OCO-2 mission, American Meteorological Society 97th Annual Meeting, Seattle, Washington, January 22nd -26th.
91. Keller, C. *et al.* (2017), Improved Air Quality Modeling in the NASA GEOS-5 Model Using a Multispecies Data Assimilation System of Tropospheric Constituents, American Meteorological Society 97th Annual Meeting, Seattle, Washington, January 22nd -26th.
92. Chatterjee, A. *et al.* (2017), Investigating Regional Carbon Flux Estimates from the GEOS-Carb system using GOSAT-ACOS and OCO-2 total column CO₂ observations, American Meteorological Society 97th Annual Meeting, Seattle, Washington, January 22nd -26th.
93. Chatterjee, A. *et al.* (2016), Influence of El Nino on atmospheric CO₂: Findings from the Orbiting Carbon Observatory-2 (OCO-2) Mission, AGU Fall Meeting, San Francisco, California, December 12th -16th.

94. Weir, B. *et al.* (2016), Intercomparison of Level 3 fields estimated from OCO-2 and GOSAT-ACOS measurements of XCO₂, AGU Fall Meeting, San Francisco, California, December 12th - 16th.
95. Kawa, R. *et al.* (2016), Space-based Lidar Measurements of Greenhouse Gases and Their Projected Impact on Quantification of Surface Sources and Sinks, AGU Fall Meeting, San Francisco, California, December 12th -16th.
96. Schimel, D. *et al.* (2016), Diver down: Remote sensing of carbon climate feedbacks, AGU Fall Meeting, San Francisco, California, December 12th -16th.
97. Feely, R. *et al.* (2016), Large-scale changes in sea-air CO₂ fluxes in the tropical and subtropical Pacific during the strong 2015-2016 El Niño event, AGU Fall Meeting, San Francisco, California, December 12th -16th.
98. Davis, K. *et al.* (2016), Atmospheric Greenhouse Gas Distributions Across Weather Systems: Results from the Summer 2016 ACT-America Field Campaign, AGU Fall Meeting, San Francisco, California, December 12th -16th.
99. Lee, E. *et al.* (2016), The effect of different time scales of atmospheric CO₂ variability on the estimation of the global terrestrial carbon cycle, AGU Fall Meeting, San Francisco, California, December 12th -16th.
100. Patra, P. *et al.* (2016), Orbiting carbon observatory (OCO-2) tracks increase of carbon release to the atmosphere during the 2014-2016 El Niño, AGU Fall Meeting, San Francisco, California, December 12th -16th.
101. Ott, L. *et al.* (2016), Reconciling bottom-up and top-down carbon flux estimates using NASA's GEOS-Carb modeling system, AGU Fall Meeting, San Francisco, California, December 12th -16th.
102. Chatterjee, A. (2016), Carbon Cycle Data Assimilation –what have we learned and where are we going, SIAM conference on Mathematics of Planet Earth, Philadelphia, Sep 30th – Oct 2nd, *invited talk*
103. Chatterjee, A. *et al.* (2016), Influence of El Nino on atmospheric CO₂: Findings from the Orbiting Carbon Observatory-2 (OCO-2) Mission, 12th International Workshop on Greenhouse Gas Measurements from Space, Kyoto, Japan, June 7th - 9th.
104. Ott, L. *et al.* (2016), “Tracer-based Estimates of Transport Uncertainty from NASA's GEOS-5 AGCM: Implications for Inversion Flux Estimates”, American Meteorological Society 96th Annual Meeting, New Orleans, Louisiana, January 10th – 14th.
105. Chatterjee, A. *et al.* (2016), “Development and Implementation of a Carbon Data Assimilation System for the Orbiting Carbon Observatory-2 (OCO-2) Mission”, American Meteorological Society 96th Annual Meeting, New Orleans, Louisiana, January 10th – 14th.
106. Chatterjee, A. *et al.* (2015), “Spatial and temporal variability of column-integrated CO₂: identifying drivers and variations from high-resolution model simulations and OCO-2 observations”, AGU Fall Meeting, San Francisco, California, December 14th -18th.
107. Crisp, D. *et al.* (2015), “Preliminary Results from the First Year of Operations of the NASA Orbiting Carbon Observatory-2 (OCO-2)”, AGU Fall Meeting, San Francisco, California, December 14th -18th.
108. Weir, B. *et al.* (2015), “Inflation factors for satellite XCO₂ retrieval errors”, AGU Fall Meeting, San Francisco, California, December 14th -18th.
109. Chatterjee, A. *et al.* (2015), “Development and implementation of the GEOS-Carb System for the OCO-2 Mission”, 11th International Workshop on Greenhouse Gas Measurements from Space, Pasadena, CA, June 16th-18th.

110. Ott, L. *et al.* (2015), “An Analysis of the Influence of GEOS-5 Transport Uncertainty on OCO-2 Model-Data Comparisons”, 11th International Workshop on Greenhouse Gas Measurements from Space, Pasadena, CA, June 16th-18th.
111. Arellano, A.F. *et al.* (2015), “Constraints on local-to-regional anthropogenic combustion from satellite retrievals of combustion-related trace gases: Implications to verifying sources of anthropogenic CO₂”, American Meteorological Society 95th Annual Meeting, Phoenix, Arizona, January 4th – 8th.
112. Chatterjee, A. *et al.* (2015), “The Madden-Julian Oscillation in the NCAR Community Earth System Model Coupled Data Assimilation System”, American Meteorological Society 95th Annual Meeting, Phoenix, Arizona, January 4th – 8th.
113. Chatterjee, A. *et al.* (2015), “Quantifying the benefit of total column CO₂ observations for constraining the global carbon budget: An inter-comparison study top-down flux estimates based on GOSAT observations with bottom-up flux estimates from MsTMIP”, American Meteorological Society 95th Annual Meeting, Phoenix, Arizona, January 4th – 8th.
114. Anderson, J. L. *et al.* (2015), “DART: Tools and Support for Ensemble Data Assimilation Research, Operations, and Education”, AGU Fall Meeting, San Francisco, California, December 15th -19th.
115. Chatterjee, A. *et al.* (2015), “The Madden-Julian Oscillation in the NCAR Community Earth System Model Coupled Data Assimilation System”, AGU Fall Meeting, San Francisco, California, December 15th -19th.
116. Chatterjee, A. *et al.* (2014), “The NCAR Coupled Data Assimilation System”, The World Weather Open Science Conference, Montreal, Canada, August 16th - 21st.
117. Chatterjee, A. *et al.* (2014), “Dynamics of the Madden-Julian Oscillation in the NCAR CESM Coupled Data Assimilation System”, The World Weather Open Science Conference, Montreal, Canada, August 16th-21st.
118. Chatterjee, A. *et al.* (2014), “Depiction of the Madden-Julian Oscillation in the NCAR Community Earth System Model Coupled Data Assimilation System”, 18th Conference on Integrated Observing and Assimilation Systems for Atmosphere, Oceans, and Land Surface (IOAS-AOLS), American Meteorological Society 94th Annual Meeting, Atlanta, Georgia, February 2nd -6th.
119. Chatterjee, A. *et al.* (2013), “Quantifying the benefit of GOSAT total column CO₂ observations for constraining the global carbon budget: An inter-comparison study with bottom-up CO₂ flux estimates from MsTMIP”, Abstract A13K-01, *Invited Talk* at 2013 Fall Meeting, American Geophysical Union, San Francisco, California, December 9th - 13th.
120. Anderson, J. L. *et al.* (2013), “DART: Tools and Support for Ensemble Data Assimilation Research, Operations, and Education”, Abstract GC23A-0880, presented at 2013 Fall Meeting, American Geophysical Union, San Francisco, California, December 9th - 13th.
121. Chatterjee, A. *et al.* (2013), “Evaluating the fidelity of a community coupled ocean-atmosphere data assimilation system”, 6th WMO Symposium on Data Assimilation, College Park, Maryland, October 7th-11th.
122. Chatterjee, A. *et al.* (2013), “Role of GOSAT total column CO₂ observations in the estimation of CO₂ surface fluxes”, 9th International Workshop on Greenhouse Gas Measurements from Space, Yokohama, Japan, May 29th-31st.
123. Chatterjee, A. *et al.* (2013), “Role of GOSAT total column CO₂ observations for the estimation of CO₂ surface fluxes”, OCO₂ Science Team Meeting, Pasadena, California, March 25th-27th.

124. Chatterjee, A. *et al.* (2013), "Background error statistics for assimilation of atmospheric CO₂", 4th North American Carbon Program - All Investigators Meeting, Albuquerque, New Mexico, February 4th - 7th.
125. Shiga, Y. P. *et al.* (2012), "In Situ CO₂ Monitoring Network Evaluation and Design: A Criterion Based on Atmospheric CO₂ Variability", Global Monitoring Annual Conference, NOAA-ESRL, Boulder, Colorado, May 15th - 17th.
126. Chatterjee, A. *et al.* (2012), "Background error statistics for assimilation of atmospheric CO₂", Abstract A11E-0093, 2012 Fall American Geophysical Union Meeting, San Francisco, California, December 3rd-7th.
127. Chatterjee, A. *et al.* (2011), "Sensitivity Tests for an ensemble square root filter for CO₂ assimilation", Abstract A43H-04, presented at the 2011 Fall American Geophysical Union Meeting, San Francisco, California, December 5th-9th.
128. Shiga, Y. P. *et al.* (2011), "A monitoring network design tool for atmospheric carbon dioxide: Validation over North America", Abstract A31B-0073, presented at the 2011 Fall American Geophysical Union Meeting, San Francisco, California, December 5th-9th.
129. Mueller, K. L. *et al.* (2011), "Assessing the impact of the expanding continuous measurement network in North America on carbon budgeting with an atmospheric inversion", Abstract A31B-0077, presented at the 2011 Fall American Geophysical Union Meeting, San Francisco, California, December 5th-9th.
130. Chatterjee, A. *et al.* (2011), "Background error statistics for assimilation of atmospheric CO₂", Abstract A33A-0175, presented at the 2011 Fall American Geophysical Union Meeting, San Francisco, California, December 5th-9th.
131. Chatterjee, A. *et al.* (2011), "A geostatistical ensemble square root filter for estimating surface fluxes of CO₂", SIAM Conference on Mathematical and Computational Issues in the Geosciences, Long Beach, California, March 21st-24th.
132. Gourджи, S. M. *et al.* (2011), "What can we learn about fossil fuel emissions across North America from a Geostatistical atmospheric CO₂ inversion using ground-based continuous measurement data?", SIAM Conference on Mathematical and Computational Issues in the Geosciences, Long Beach, California, March 21st-24th.
133. Mueller, K. L. *et al.* (2011), "Impact of the expanding measurement network on top-down budgeting of CO₂ surface fluxes in North America", AmeriFlux Science Meeting and 3rd NACP All-Investigators Meeting, New Orleans, LA, Jan 31st - Feb 4th.
134. Shiga, Y. P. *et al.* (2010), "Evaluating the North American in-situ carbon dioxide monitoring network", Abstract GC13D-0726, presented at 2010 Fall Meeting, AGU, San Francisco, Calif., December 13th - 17th.
135. Yadav, V. *et al.* (2010), "Design Framework for a Real-Time Large-Scale, Parallel, Intelligent, CO₂ Data Assimilation System", Computational Discovery and Cyber-Infrastructure at University of Michigan, Ann Arbor, Michigan.
136. Gourджи, S. M. *et al.* (2010), "Estimating regional-scale CO₂ fluxes over North America within a geostatistical atmospheric inversion framework", *Eos Transactions*, American Geophysical Union, 91(26), Meeting of the Americas Supplement, Abstract A13H-05.
137. Michalak, A. M. *et al.* (2010), "Geostatistical Analyses for XCO₂: Mapping and Modeling Global CO₂", Invited Talk at OCO₂-ACOS Science Team Meeting, California Institute of Technology, Pasadena, California.

138. Michalak, A. M. *et al.* (2009), “A Geostatistical Data Fusion Technique for Merging Remote-sensing and Ground-based Observations of Aerosol Optical Thickness,” *Eos Transactions*, American Geophysical Union, 90(52), Fall Meeting Supplement, *Invited Talk*.
139. Hammerling, D.M. *et al.* (2009), “Mapping Global CO₂: Impact of Temporal Variability on Geostatistical Gap-filling for the Orbiting Carbon Observatory,” *Geophysical Research Abstracts*, 11, EGU2009-11407.
140. Chatterjee, A. *et al.* (2008), “A geostatistical data fusion technique for merging MISR and MODIS Aerosol Optical Thickness (AOT) retrievals with AERONET AOT measurement,” *Eos Transactions*, American Geophysical Union, 89(53), Fall Meeting Supplement, Abstract A23B-0286.
141. Michalak, A.M. *et al.* (2008), “Mapping Global CO₂: Geostatistical Gap Filling and Uncertainty Assessment for the Orbiting Carbon Observatory,” *Eos Transactions*, American Geophysical Union, 89(53), Fall Meeting Supplement, Abstract A43F-05.
142. Chatterjee, A. *et al.* (2008), “Improving Estimation of over Lake Precipitation-An Application to Lake Erie”, International Association for Great Lakes Research’s 51st Annual Conference, May 2008, Peterborough, Ontario.
143. Chatterjee, A. *et al.* (2007), “Improving Estimation of Over Lake Precipitation-An Application to Lake Erie”, *Eos Transactions*, American Geophysical Union, 88(52), Fall Meeting Supplement, Abstract H33A-0972.
144. Chatterjee, A. *et al.* (2007), “Spatial and Temporal Analysis of Sea Surface Temperature (SST) in the Great Lakes,” Poster presented at the Challenges of Climate Change in the Great Lakes Region Summit, U M Biological Station, Pellston, Michigan.
145. Chatterjee, A. and Y. Zhou (2007), “Spatial Analysis of Sea Surface Temperature (SST) Distribution in Lake Ontario,” Poster presented at the Michigan Geophysical Union (MGU) Conference, The University of Michigan, Ann Arbor, Michigan.

Seminar Presentations

1. Chatterjee, A. (2024), Constraining carbon cycle dynamics using space-based observations: plans, updates and highlights from NASA’s OCO missions, Department of Forest and Wildlife Ecology, University of Wisconsin-Madison, Madison, Wisconsin
2. Chatterjee, A. (2023), Observing the global carbon cycle, JPL Center for Climate Sciences and The Keck Institute for Space Studies Climate Science Summer School: Using Satellite Observations to Advance Climate Models, Pasadena, California
3. Chatterjee, A. (2021), From diagnosis to attribution: constraining carbon cycle dynamics using remote-sensing missions, School of Informatics, Computing, and Cyber Systems Seminar Series, Northern Arizona University, Flagstaff, Arizona
4. Chatterjee, A. (2019), El Niño 2015-2016 and its impact on the carbon cycle, Atmospheric and Oceanic Science Departmental Seminar Series, University of Maryland, College Park, Maryland
5. Chatterjee, A. and D. Crisp (2018), Satellite based Ocean Carbon Observations, Synthesis and intercomparison of ocean carbon uptake in CMIP6 models Working Group and Workshop, Washington, D.C.
6. Chatterjee, A. (2018), Constraining carbon cycle dynamics using contemporary observations: achievements, challenges and opportunities, Earth Science Colloquium Series, Lamont Doherty Earth Observatory, Columbia University, New York

7. Chatterjee, A. *et al.* (2018), Carbon cycle OSSEs: from informing future space-based observing strategies to reducing fundamental carbon cycle process uncertainties, Piers Sellers IDS Colloquium and Summer Fest, Fort Collins, Colorado
8. Chatterjee, A. *et al.* (2017), Arctic Carbon Cycle Modeling in ABoVE, presentation at the Terrestrial Ecosystems, Permafrost and Environmental Intelligence Collaboration Meeting, Interagency Arctic Research Policy Committee (IARPC) Collaborations Webinar
9. Chatterjee, A. *et al.* (2015), Development and Implementation of GEOCAS (Goddard Earth Observing Carbon Assimilation System) for the Orbiting Carbon Observatory-2 Mission, NASA Goddard Earth Sciences Young Scientist Forum, Greenbelt, Maryland
10. Chatterjee, A. (2014), Carbon Cycle Data Assimilation: what have we learned and where are we going? Department of Atmospheric, Oceanic and Space Sciences Fall Seminar Series, The University of Michigan, Ann Arbor, Michigan
11. Cody, E.D. and A. Chatterjee (2014), Three-dimensional Variation of Atmospheric CO₂: A Comparison of Aircraft Measurements with Inverse Model Simulations, SOARS Colloquium, University Corporation for Atmospheric Research, Boulder, Colorado
12. Chatterjee, A. (2014), A Perspective on the Role of Data Assimilation in the Geosciences: combining complex models with uncertain data, 14th NOAA Visiting Scientists Program Summer Institute, Steamboat Springs, Colorado
13. Chatterjee, A. (2014), Tropical Intraseasonal Oscillations in the NCAR coupled data assimilation system, Atmospheric Modeling & Predictability Section Meeting, NESL's Climate and Global Dynamics Division, National Center for Atmospheric Research, Boulder, Colorado
14. Chatterjee, A. (2013), Role of GOSAT total column CO₂ observations in the estimation of CO₂ surface fluxes, National Center for Atmospheric Research Annual Meeting, Breckenridge, Colorado
15. Chatterjee, A. (2011), Quantifying CO₂ flux variability using geostatistical ensemble filters: current challenges and future potential, CGD 2011-2012 CGD Seminar Series, National Center for Atmospheric Research, Boulder, Colorado
16. Chatterjee, A. and A. M. Michalak (2010), Data Assimilation for Atmospheric CO₂ Estimation, Internal Seminar Series at the NOAA-ESRL, Global Monitoring Division, Boulder, Colorado.
17. Chatterjee, A. (2007), Improving Estimation of Over Lake Precipitation-An Application to Lake Erie, Technical Report Submitted to the Great Lakes Environmental Research Laboratory (GLERL), Ann Arbor, Michigan
18. Chatterjee, A. *et al.* (2007), Over Lake Precipitation Estimation, Summer Fellow Presentation at the Great Lakes Environmental Research Laboratory (GLERL), Ann Arbor, Michigan

Thesis

1. Chatterjee, A. (2012), "Data Assimilation for Atmospheric CO₂: Towards Improved Estimates of CO₂ Concentrations and Fluxes", PhD Thesis, The University of Michigan, Ann Arbor, Available at - <http://deepblue.lib.umich.edu/handle/2027.42/96172>

Outreach Activities / Press Articles

I consider talking to the press an important outreach activity as they play a critical role in disseminating scientific information to the public. Here are a few examples of my recent interactions with the press:

1. "[*From Monitoring to Action*](#)" (Aerospace America)
2. "[*NCA5 Webinar – Climate Trends*](#)" (U.S. Global Change Research Program)
3. "[*The Global Carbon Budget*](#)" (Climate Central)
4. "[*Carbon From Space*](#)" (The Week on Earth Podcast)
5. "[*How We Can Better Predict Weather Catastrophes*](#)" (The New York Times Opinion)
6. "[*New 3D View of Methane Tracks Sources and Movement around the Globe*](#)" (NASA Earth Science)
7. "[*New Findings in Carbon Cycle Science*](#)" (AGU Fall Meeting Press Conference)
8. "[*Global Warming's Frozen Giant*](#)" (Inside Science)
9. "[*Watching the Carbon Cycle from Space*](#)" (NUSci)
10. "[*NASA Satellite Reveals Source of El Niño–Fueled Carbon Dioxide Spike*](#)" (Scientific American)
11. "[*A NASA satellite that monitors CO₂ is revealing the inner workings of our planet*](#)" (The Verge)
12. "[*NASA satellites show our 'breathing' planet in action*](#)" (CarbonBrief.org)
13. Also interviews with Bloomberg News, Vice, NASA Science Communications Office, Press Trust of India.