

**JEFFREY A. GEDDES, Ph.D.**

Assistant Professor  
 Boston University, Department of Earth & Environment  
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**RESEARCH INTERESTS:**

Atmospheric chemistry including chemical transport modeling, atmosphere-biosphere interactions, impacts of land use and land cover changes, urban air quality, and satellite remote sensing of air pollution

**EDUCATION:**

- 2013            **University of Toronto**, PhD. Chemistry (supervisor: Jennifer G. Murphy)  
*Thesis Title: "Observations of reactive nitrogen oxides: from urban ground level ozone production to biosphere-atmosphere exchange in remote forest environments"*
- 2008            **University of Toronto at Mississauga**, B.Sc. Chemistry and Geology

**APPOINTMENTS:**

- 2016 -            Assistant Professor, Department of Earth & Environment, Boston University  
                     *Core Faculty Member, Global Development Policy Center (2020 - )*  
                     *Core Faculty Member, BU URBAN (2017 - )*  
                     *Affiliated Faculty, Biogeosciences Certificate Program (2017 - )*  
                     *Affiliated Faculty, Center for Remote Sensing (2016 - )*
- 2014 – 2015    Visiting Postdoctoral Research Fellow, MIT (supervisor: Colette Heald)
- 2013 – 2016    IACPES Postdoctoral Research Fellow, Dalhousie University (supervisor: Randall Martin)

**AWARDS:**

- 2022            Frederick S. Pardee Center Faculty Research Fellow
- 2018            NSF CAREER Award (Atmospheric Chemistry)
- 2018            NASA New (Early Career) Investigator Program Award (Earth Sciences)
- 2016            Early Career Travel Grant, International Global Atmospheric Chemistry (IGAC)
- 2015            ACCESS XIII Atmospheric Chemistry Colloquium for Emerging Senior Scientists
- 2013 – 2015    NSERC CREATE IACPES Postdoctoral Fellowship
- 2009 – 2012    NSERC Canadian Graduate Scholarship (Doctoral)

**GRANT ACTIVITY:**

- 2023 -            Historical trends and near-real-time hindcasts of global total atmospheric deposition (**PI**); Environment & Climate Change Canada; \$90,000
- 2023 -            Collaborative Research: Understanding Emission Sources and Sinks of Nitrous Acid in North American Forests (**Institutional PI**); NSF; \$952,144 (\$55,555 to BU)
- 2023 -            Multi-Scale Modeling and Remote Sensing of Air Quality in a Coastal Urban Environment (**PI**); NASA; \$553,127

- 2020 - CO2-Air Quality Urban Synthesis and Analysis (“CO2-AQ USA”) Project: Trends & Drivers of Urban Emissions from Past, Present, to Future (**Institutional PI**); NOAA; \$992,682 (\$345,692 to BU)
- 2018 - CAREER: Air Quality Impacts of Dynamic Forest-Atmosphere-Chemistry Interactions (**PI**); NSF; \$692,975
- 2022 - 2023 Global Air Quality at the 22<sup>nd</sup> Century: The Role of Climate- and Land Use-Driven Perturbations to Atmospheric Nitrogen Cycling (**PI**); The Frederick S. Pardee Center for the Study of the Longer-Range Future (Boston University); \$14,000
- 2021 - 2023 Measurement-Model Fusion for Global Total Atmospheric Deposition Initiative (**PI**); Environment & Climate Change Canada; \$85,000
- 2020 - 2023 Remote-Sensing of Surface-Level Ozone Sensitivity to Nitrogen Oxides and Volatile Organic Compounds (**Institutional PI**); NASA; \$717,304 (\$65,595 to BU)
- 2020 - 2022 Global China Initiative: Greening China’s Overseas Investments (**Co-I**); Global Policy Development Center (Boston University); \$37,165
- 2018 - 2022 Remote Sensing of Surface Air Quality: New Insight into Intra-Urban Variability in Tropospheric NO<sub>2</sub> and HCHO (**PI**); NASA; \$280,711

**PEER REVIEWED PUBLICATIONS:** Underline denotes supervisee. In general, I have adopted the convention of appearing next to first author(s) on manuscripts from students or postdocs that I have directly supervised.

- 2023 **Rindy JE**, Pierce EA (co-first author), **Geddes JA**, Gewirtzman J, Hutyra L, Templer PH. Effects of urbanization and forest fragmentation on atmospheric nitrogen inputs and ambient nitrogen oxide and ozone concentrations in mixed temperate forests. *Journal of Geophysical Research Biogeosciences*, <https://doi.org/10.1029/2023JG007543>.
- 2023 **Adams TJ**, **Geddes JA**, Spinei ES. New insights into the role of atmospheric transport and mixing on column and surface concentrations of NO<sub>2</sub> at a coastal urban site. *Journal of Geophysical Research Atmospheres*, <https://doi.org/10.1029/2022JD038237>.
- 2023 **Wang B**, **Geddes JA**, **Adams TJ**, Spinei ES, McDonald BC, He J, Harkins C, Li D, Pfister GG. Implications of sea breezes on air quality monitoring in a coastal urban environment: evidence from high resolution modeling of NO<sub>2</sub> and O<sub>3</sub>. *Journal of Geophysical Research Atmospheres*, <https://doi.org/10.1029/2022JD037860>.
- 2023 Souri AH, Kumar R, Chong H, Golbazi M, Knowland KE, **Geddes JA**, Johnson MS. Decoupling in the vertical shape of HCHO during a sea breeze event: The effect on trace gas satellite retrievals and column-to-surface translation. *Atmospheric Environment*, <https://doi.org/10.1016/j.atmosenv.2023.119929>.
- 2023 Johnson MS, Philip S, Kumar R, Naeger A, Souri AH, **Geddes JA**, Judd L, Janz S, Sullivan J. Satellite remote-sensing capability to assess tropospheric column ratios of formaldehyde and nitrogen dioxide: case study during the LISTOS 2018 field campaign. *Atmospheric Measurement Techniques*, <https://doi.org/10.5194/amt-16-2431-2023>.
- 2023 Borduas-Dedekind N, Naidoo M, Zhu B, **Geddes JA**, Garland RM. Tropospheric ozone pollution in Johannesburg, South Africa: Exceedances, diurnal cycles, seasonality, Ox chemistry and O<sub>3</sub> production rates. *Clean Air Journal*, <https://doi.org/10.17159/caj/2023/33/1.15367>.

- 2022 **Geddes JA**, Pusede SE, **Wong AYH**, Changes in the relative importance of biogenic isoprene and soil NO<sub>x</sub> emissions on ozone concentrations in nonattainment areas of the United States, *Journal of Geophysical Research Atmospheres*, doi: 10.1029/2021JD036361.
- 2022 **Wong AYH**, **Geddes JA**, Ducker JA, Holmes CD, Fares S, Goldstein AH, Mammarella I, Munger, JW, New evidence for the importance of non-stomatal pathways in ozone deposition during extreme heat and dry anomalies, *Geophysical Research Letters*, doi: 10.1029/2021GL095717
- 2022 Fu J, Carmichael G, Dentener F, Aas W, Andersson C, Barrie L, Cole A, Galy-Lacau C, **Geddes JA**, Itahashi S, Kanakidou M, Labrador L, Paulot F, Schwede D, Tan J, and Vet R, Improving estimates of sulfur, nitrogen, and ozone total deposition through multi-model and measurement-model fusion, *Environmental Science & Technology*, doi: 10.1021/acs.est.1c05929
- 2021 **Wong AYH** and **Geddes JA**. Examining the competing effects of contemporary land management vs. land cover changes on global air quality, *Atmospheric Chemistry and Physics*, doi: 10.5194/acp-21-16479-2021
- 2021 **Geddes JA**, **Wang B**, and Li D. Ozone and nitrogen dioxide pollution in a coastal urban environment: The role of sea breezes, and implications of their representation for remote sensing of local air quality, *Journal of Geophysical Research: Atmospheres*, doi:10.1029/2021JD035314
- 2021 **Radford AC**, **Geddes JA**, Gallagher KP, and Larson BA, Open-source methods for estimating health risks of fine particulate matter from coal-fired power plants: A demonstration from Karachi, Pakistan, *Environmental Impact Assessment Review*, doi:10.1016/j.eiar.2021.106638
- 2020 Demetillo MAG, Navarro A, Knowles KK, **Geddes JA**, Nowlan CR, Janz SJ, Judd LM, Al-Saadi J, Sun K, McDonald BC, Diskin GS, and Pusede SE. Observing air pollution inequality using high spatial resolution nitrogen dioxide remote sensing measurements in Houston, Texas. *Environmental Science & Technology*, doi: 10.1021/acs.est.8b04852
- 2020 Lapierre JL, Laughner JL, **Geddes JA**, Koshak W, Cohen RC, and Pusede SE. Observing regional variability in lightning NO<sub>x</sub> production rates. *Journal of Geophysical Research: Atmospheres*, doi:10.1029/2019JD031362
- 2019 **Wong AYH**, **Geddes JA**, Tai APK, and Silva SJ. Importance of dry deposition parameterization choice in global simulations of surface ozone. *Atmospheric Chemistry and Physics*, doi:10.5194/acp-19-14365-2019
- 2019 Demetillo MA, Anderson JF, **Geddes JA**, Xi Y, Najacht EY, Herrera SA, Kabasares KM, Kotsakis AE, Lerdau MT, and Pusede SE. Observing severe drought influences on ozone air pollution in California. *Environmental Science & Technology*, doi:10.1021/acs.est.8b04852
- 2018 **Geddes JA**, Martin RV, Bucsela EJ, McLinden C, and Cunningham DJM. Stratosphere-troposphere separation of nitrogen dioxide columns from the TEMPO geostationary satellite instrument. *Atmospheric Measurement Techniques*, 11, doi:10.5194/amt-11-6271-2018
- 2018 Petroff A, Murphy JG, Thomas SC, and **Geddes JA**. Size-resolved aerosol flux above a temperate broadleaf forest: Measurements and modelling. *Atmospheric Environment*, 190: 359-375

- 2018 Zhou S, Tai A, Sun S, Sadiq M, Heald CL, and **Geddes JA**. Coupling between surface ozone and leaf area index in a chemical transport model: Strength of feedback and implications for ozone air quality and vegetation health. *Atmospheric Chemistry and Physics*, 18, doi:10.5194/acp-18-14133-2018.
- 2017 **Geddes JA**, and Martin RV. Global deposition of total reactive nitrogen oxides from 1996 to 2014 constrained with satellite observations of NO<sub>2</sub> columns. *Atmospheric Chemistry and Physics*, 17, 10071-10091, doi:10.5194/acp-17-10071-2017.
- 2017 Larkin A, **Geddes JA**, Martin RV, Xiao Q, Liu Y, Marshall DJ, Brauer M, and Hystad P. A global land use regression model for nitrogen dioxide air pollution. *Environmental Science & Technology*, doi:10.1021/acs.est.7b01148.
- 2017 Zheng T, Chen J, He L, Arain MA, Thomas SC, Murphy JG, **Geddes JA**, and Black TA. Inverting the maximum carboxylation rate (V<sub>cmax</sub>) from the sunlit leaf photosynthesis rate derived from measured light response curves at tower flux sites. *Agricultural and Forest Meteorology*, 236, 48-666.
- 2016 **Geddes JA**, Heald CL, Silva SJ, and Martin RV. Land cover change impacts on atmospheric chemistry: simulating projected large-scale tree mortality in the United States. *Atmospheric Chemistry and Physics*, 16, 2323-2340, doi:10.5194/acp-16-2323-2016.
- 2016 **Geddes JA**, Martin RV, Boys BL and van Donkelaar A. Long-term trends worldwide in ambient NO<sub>2</sub> concentrations inferred from satellite observations. *Environmental Health Perspectives*, doi: 10.1289/ehp.1409567.
- 2016 Heald CL, and **Geddes JA**. The Impact of Historical Land Use Change From 1850 to 2000 on Particulate Matter and Ozone. *Atmospheric Chemistry and Physics*, 16, 14997-15010, doi:10.5194/acp-16-14997-2016.
- 2016 Silva SJ, Heald CL, **Geddes JA**, Austin KG, Kasibhatla PS, and Marlier ME. Impacts of current and projected oil palm plantation expansion on air quality over Southeast Asia. *Atmospheric Chemistry and Physics*, 16, 10621-10635, doi:10.5194/acp-16-10621-2016.
- 2016 Larkin A, van Donkelaar A, **Geddes JA**, Martin RV, and Hystad P. Relationships between Changes in Urban Characteristics and Air Quality in East Asia from 2000 to 2010. *Environmental Science & Technology*, doi:10.1021/acs.est.6b02549.
- 2014 **Geddes JA**, Murphy JG, Schurman J, Petroff A, and Thomas SC. Net ecosystem exchange of an uneven-aged managed forest in central Ontario, and the impact of a spring heat wave event. *Agricultural and Forest Meteorology*, 198-199: 105-115.
- 2014 **Geddes JA**, and Murphy JG. Observations of reactive nitrogen oxide fluxes by eddy covariance above two mid-latitude North American mixed hardwood forests. *Atmospheric Chemistry and Physics*, 14: 2939-2957.
- 2014 Pugliese SC, Murphy JG, **Geddes JA**, and Wang JM. The impacts of precursor reduction and meteorology on ground-level ozone in the Greater Toronto Area. *Atmospheric Chemistry and Physics*, 14: 8197-8207.
- 2013 Wang JM, Murphy JG, **Geddes JA**, Winsborough CL, Basiliko N, and Thomas SC. Methane fluxes measured by eddy covariance and static chamber techniques at a temperate forest in central Ontario, Canada. *Biogeosciences*, 10: 4371-4382.

- 2012 **Geddes JA**, Murphy JG, Celarier EA, and O'Brien J. Biases in long-term NO<sub>2</sub> averages inferred from satellite observations due to cloud selection criteria. *Remote Sensing of Environment*, 124: 210-216.
- 2009 **Geddes JA**, Murphy JG, and Wang DW. Long term changes in nitrogen oxides and volatile organic compounds in Toronto and the challenges facing local ozone control. *Atmospheric Environment*, 43: 3407-3414.
- 2007 **Geddes JA**, and Moore GWK. A climatology of sea ice embayments in the Cosmonaut Sea, Antarctica. *Geophysical Research Letters*, 34: doi:10.1029/2006GRL027910.

#### REPORTS, BOOK CHAPTERS, AND OTHER NON-REFEREED PUBLICATIONS:

- 2021 Kanakidou M et al. (**Geddes JA**, contributing author). Global Atmospheric Watch Report No. 269, "Measurement-Model Fusion for Global Total Atmospheric Deposition (MMF-GTAD) Initiative Implementation Plan for 2021–2026". WMO, Geneva, Switzerland.
- 2020 Labrador L and Vet R (Eds) (**Geddes JA**, contributing author). Global Atmospheric Watch Report No. 250, "Expert Meeting on Measurement-Model Fusion for Global Total Atmospheric Deposition". World Meteorological Organization, Geneva, Switzerland.
- 2019 Chance K et al. (**Geddes JA**, contributing author). TEMPO Green Paper: Chemistry, physics, and meteorology experiments with the Tropospheric Emissions: monitoring of pollution instrument. SPIE Remote Sensing: Sensors, Systems, and Next-Generation Satellites XXII, Proceedings Volume 11151. doi:10.1117/12.2534883.
- 2017 Carou S et al. (**Geddes JA**, contributing author). Global Atmospheric Watch Report No. 234, "Measurement-Model Fusion for Global Total Atmospheric Deposition". WMO, Geneva, Switzerland.
- 2012 **Geddes JA**, and Murphy JG. The Science of Smog: Chemical concepts in ground level ozone and particulate matter. Chapter 10 in *The Handbook of Metropolitan Sustainability* (Ed. Frank Zeman). Woodhead Publishing Ltd. Philadelphia PA.

#### INVITED ACADEMIC SEMINARS: († denotes international seminar)

- 2023 **Texas Commission on Environmental Quality Office of Air Modeling and Data Analysis**, "Challenges and Opportunities in Urban Air Quality Remote Sensing: Lessons from Boston and Salt Lake City"
- 2023 **Indiana University**, Environmental Science Seminar Series, "Sources and Sinks in the Biosphere: Improving Predictions of Ecosystem-Atmosphere-Chemistry Interactions"
- 2023 **Massachusetts Institute of Technology**, Program in Atmospheres, Oceans, & Climate Colloquium Series, "Challenges and Opportunities in Coastal Urban Air Quality Research: Lessons from the Boston Basin"
- 2022 †**University of Toronto**, Distinguished Lecturer, Center for Global Change Science, "Contemporary and Future Changes in Biosphere-Atmosphere-Chemistry Interactions"
- 2022 **University of Utah**, Department of Atmospheric Sciences Seminar, "Challenges and Opportunities in Coastal Urban Air Quality Monitoring: Lessons from the Boston Basin"
- 2021 **University of Wyoming**, Department of Atmospheric Science Seminar Series, "Examining the impacts of biosphere-atmosphere-chemistry interactions over decadal timescales"

- 2021 †**Environment and Climate Change Canada**, Air Quality Research Division Seminar Series, “Air Quality and Surface-Atmosphere Interactions: Modeling and remote sensing from urban-to-global scales”
- 2021 †**Dalhousie University**, Atmospheric Science Seminar Series, “Exploring Contemporary Changes in Biosphere-Atmosphere-Chemistry Interactions”
- 2020 **Frontiers in Atmospheric Chemistry Seminar Series**, co-hosted by Massachusetts Institute of Technology, Colorado State University, University of Michigan, Reed College, University of Toronto, and University of California Davis (Attended by >300 participants internationally) “Exploring Contemporary Changes in Biosphere-Atmosphere-Chemistry Interactions”
- 2019 **University of Washington**, Department of Atmospheric Sciences Colloquium, “Checking Atmospheric Chemistry's Pulse: Modeling and Remote Sensing of Biosphere Interactions”
- 2018 **Boston University**, Department of Chemistry, Physical Chemistry Seminar Series, “Keeping an Eye on the Atmosphere: Modeling and Remote Sensing of Atmospheric Chemistry”
- 2017 **Harvard University**, Atmospheric and Environmental Chemistry Seminar Series, “Air Quality and the Biosphere: What is the view from space?”
- 2017 **Boston University**, Biogeosciences Seminar Series, “Air Quality and the Biosphere: What is the view from space”
- 2016 †**University of Toronto**, Department of Chemistry, “Air quality and biosphere interactions: Measuring and modeling global change”
- 2016 **Colorado State University**, Department of Civil and Environmental Engineering, “Air quality and biosphere interactions: Measuring and modeling global change”
- 2015 **University of Virginia**, Department of Environmental Sciences Seminar Series, “Air quality and biosphere-atmosphere interactions: Observations from space and in the field”
- 2015 **University of California Riverside**, Bourns College of Engineering, “Telling the Whole Story: Impacts of Atmospheric Nitrogen Oxides at Global, Regional, and Local Scales”
- 2015 **Harvard-Smithsonian Center for Astrophysics**, Atomic and Molecular Physics Seminar, “Trends in ambient NO<sub>2</sub> using satellite data and chemical transport modeling”
- 2013 **Cornell University**, Department of Earth and Atmospheric Sciences, “Urban Ozone Production and Biosphere-Atmosphere Exchange”
- 2013 **Dalhousie University**, Atmospheric Science Seminar Series, “Observations of Reactive Nitrogen Oxides: From Ground Level Ozone Production to Biosphere-Atmosphere Exchange in Downwind Forest Environment”

**INVITED CONFERENCE & WORKSHOP PRESENTATIONS:** († denotes international conference/workshop)

- 2023 **Pandora User Group Meeting**, “Meteorological Influences on Column to Surface Relationships: Lessons from Boston and Salt Lake City” (Washington DC)
- 2023 **Gordon Research Conference in Atmospheric Chemistry**, “Sources and Sinks in the Biosphere: Advancing Our Predictive Capacity of Ecosystem-Atmosphere-Chemistry Interactions” (Newry ME)

- 2023 **Telluride Science Research Center, Mapping Urban Air: Linking Observations and Processes**, “Ground-Based Remote Sensing of Air Quality in Boston and Salt Lake City” (Telluride CO)
- 2023 **American Chemical Society Spring Meeting**, “Sources and Sinks in the Biosphere: Advancing Our Predictive Capacity of Ecosystem-Atmosphere-Chemistry Interactions” (Indianapolis IN)
- 2022 **†World Meteorological Organization, Workshop on the Measurement-Model Fusion for Global Total Atmospheric Deposition Initiative**, “A Pilot Project for Calculating Global O<sub>3</sub> Surface Flux Ensembles” and “Opportunities for Satellite Fusion Methods in Total Atmospheric Deposition Estimates” (Geneva)
- 2021 **National Atmospheric Deposition Program Fall Science Symposium**, “The WMO Measurement Model Fusion for Global Total Atmospheric Deposition Initiative: Supporting Science, Policy, and Sustainable Development Goals” (Remote)
- 2021 **Telluride Science Research Center, Mapping Urban Air: Linking Observations and Processes**, “Ground- and Satellite-Based Remote Sensing of a Coastal Urban Environment” (Telluride CO)
- 2021 **†Intensive Workshop on Atmospheric and Environmental Chemistry**, Co-Hosted by Carnegie Mellon University and University of Saskatchewan, “Atmospheric Chemical Transport Modeling: When, Why, and How?” (Remote)
- 2020 **TOLNet-Pandora Science Team Workshop**, “Early Results from an Intra-Urban Deployment of Pandoras in a Coastal Urban Environment” (Remote)
- 2019 **†World Meteorological Organization, Expert Meeting on Measurement-Model Fusion for Global Total Atmospheric Deposition**, “Insight from Satellite Remote Sensing for Measurement-Model Fusion Estimates of Atmospheric Deposition” (Geneva)
- 2018 **†GEMS Science Team Meeting**, “NO<sub>2</sub> Stratosphere-Troposphere Separation Strategy for TEMPO (and possible lessons for GEMS)” (Seoul)
- 2018 **TEMPO Science Team Meeting**, “Stratosphere-Troposphere Separation of Nitrogen Dioxide” (Boulder CO)
- 2018 **†Canadian Society for Chemistry Conference**, “Investigating Rapid Contemporary Changes in Biosphere-Atmosphere-Chemistry Interactions with a Chemical Transport Model” (Edmonton AB)
- 2017 **†World Meteorological Organization, Expert Meeting on Measurement-Model Fusion for Global Total Atmospheric Deposition**, “Satellite Measurement-Model Fusion for Applications in Health and Atmospheric Deposition” (Geneva Switzerland)
- 2017 **TEMPO Science Team Meeting**, “Stratosphere-Troposphere Separation (STS) for NO<sub>2</sub>” (Cambridge MA)
- 2016 **TEMPO Science Team Meeting**, “Development of Methods for Retrieval and Interpretation of TEMPO NO<sub>2</sub> columns for Top-down Constraints on NO<sub>x</sub> Emissions and NO<sub>y</sub> Deposition” (Washington DC)
- 2014 **Summer Course in Atmospheric Chemistry and Physics**, Hosted by York University, Center for Atmospheric Chemistry, “Satellite Observations of Chemical Composition” (Toronto ON)

**CONTRIBUTED CONFERENCE & WORKSHOP PRESENTATIONS (First Author):**

- 2023 **American Geophysical Union Fall Meeting**, “Horizontal and Vertical Gradients in Air Quality Detected by a Pandora Network in Salt Lake City: Implications for Geostationary Observations” (San Francisco, Talk)
- 2022 **American Geophysical Union Fall Meeting**, “Challenges and Opportunities in Coastal Urban Air Quality Monitoring: Lessons from the Boston Basin” (Chicago, Poster)
- 2022 **International Global Atmospheric Chemistry (IGAC) Conference**, “Integrated Modeling and Remote Sensing of Air Quality in a Coastal Urban Environment: Challenges and Insights from the Boston Basin” (Manchester UK, Virtual Poster)
- 2022 **International GEOS-Chem Meeting**, “Impact of Global Climate and Land Use Change on Soil Reactive Nitrogen Emissions” (St Louis MO, Poster)
- 2021 **TEMPO Science Team Meeting**, “Two Years of Pandora Measurements in Boston: Lessons Learned with a view towards geostationary satellite evaluation” (Remote, Poster)
- 2020 **TEMPO Science Team Meeting**, “Early Results from a Pandora Network in Boston” (Remote, Poster)
- 2019 **Gordon Research Conference on Atmospheric Chemistry**, “Biogenic ozone precursors in nonattainment areas of the US: Decreasing sensitivity to isoprene, increasing vulnerability to soil NO<sub>x</sub> (Newry ME, Poster)
- 2019 **TEMPO Science Team Meeting**, “Optimized Pandora Network for Urban-Scale Evaluation”, (Madison WI, Talk)
- 2018 **American Geophysical Union Fall Meeting**, “Characterizing Sea Breeze Effects on Surface Ozone Concentrations in the Boston Region, and Implications for Remote Sensing of Local Air Quality” (Washington DC, Talk)
- 2017 **American Geophysical Union Fall Meeting**, “Impacts of Interannual Variability in Biogenic VOC Emissions near Transitional Ozone Production Regimes” (New Orleans LA, Talk)
- 2017 **Gordon Research Conference on Atmospheric Chemistry**, “Interannual Variability of Biogenic Isoprene Emissions: Tipping the Scales Near Transitional Ozone Production Regimes?”, (Newry ME, Poster)
- 2017 **International GEOS-Chem Meeting**, “Global Deposition of Reactive Nitrogen Oxides Constrained with Satellite Observations of NO<sub>2</sub>” (Cambridge MA, Talk)
- 2016 **American Geophysical Union Fall Meeting**, “Strategies for Stratosphere-Troposphere Separation of Nitrogen Dioxide Columns from the TEMPO Geostationary Instrument” (San Francisco CA, Poster)
- 2016 **International Global Atmospheric Chemistry (IGAC) Conference**, “Rapidly changing interactions between forests and atmospheric chemistry: Contemporary changes in land use and anthropogenic emissions” (Breckenridge CO, Poster)
- 2015 **American Geophysical Union Fall Meeting**, “Simulating the impacts of large scale insect-and disease-driven tree mortality on atmospheric chemistry” (San Francisco CA, Talk)
- 2015 **Gordon Research Conference on Atmospheric Chemistry**, “Simulating insect-driven tree mortality impacts on atmospheric chemistry” (Waterville Valley NH, Poster)
- 2015 **International GEOS-Chem Meeting**, “A new land use module for GEOS-Chem” (Cambridge MA, Talk)



- 2014 **American Geophysical Union Fall Meeting**, “Integrating satellite observations, chemical transport modeling, and population data to estimate decadal trends in ground-level NO<sub>2</sub> exposure worldwide” (San Francisco CA, Poster)
- 2014 **IACPES Symposium**, Deriving long-term spatially averaged surface NO<sub>2</sub> concentrations across multiple satellite instruments” (Toronto ON, Talk)
- 2013 **National Atmospheric Deposition Program Annual Meeting and Scientific Symposium**, Reactive nitrogen oxides fluxes above two mid-latitude North American mixed hardwood forests” (Park City UT, Talk)
- 2012 **American Geophysical Union Fall Meeting**, “Observations of reactive nitrogen oxide fluxes by eddy covariance above a mid-latitude mixed hardwood” (San Francisco CA, Talk)
- 2012 **American Meteorological Society Meeting, Conference on Atmospheric Biogeosciences**, “Observations of mixing ratios and fluxes of reactive nitrogen oxides above a mixed hardwood forest in central Ontario during the summer and fall of 2011” (Boston MA, Talk)
- 2012 **American Meteorological Society Meeting, Conference on Atmospheric Biogeosciences**, “Observations of canopy-scale carbon fluxes at a mid-latitude mixed hardwood forest and decreased growing season productivity due to record high temperatures during leaf emergence” (Boston MA, Talk)
- 2011 **Canadian Meteorological and Oceanographic Society Meeting**, “Biosphere-atmosphere exchange at a mixed hardwood forest in Central Ontario subject to high nitrogen deposition” (Victoria BC, Talk)
- 2010 **Canadian Meteorological and Oceanographic Society and Canadian Geophysical Union Joint Meeting** “Potential selection biases in satellite observations of NO<sub>2</sub> and SO<sub>2</sub> due to clouds” (Ottawa ON, Talk)
- 2009 **Canadian Society of Chemistry Meeting**, “Investigation of the role of Ox partitioning and particle load on nocturnal Ox loss” (Hamilton ON, Poster)
- 2008 **American Geophysical Union Fall Meeting**, “Investigating long term changes in nitrogen oxides and volatile organic compounds in the city of Toronto and their effect on local ozone production” (San Francisco CA, Poster)

**OTHER CONFERENCE & WORKSHOP PRESENTATIONS (Contributing Author):** (Underline denotes trainee)

- 2023 **American Geophysical Union Fall Meeting**, Wang B et al., “Progress Towards a Global Ozone Flux Framework for Evaluating Hot Spots and Uncertainties” (San Francisco, Talk)
- 2023 **American Geophysical Union Fall Meeting**, Souri A et al., “Unusual formaldehyde (HCHO) vertical profile shapes during a sea breeze event: Implications for geostationary satellite trace gas retrievals” (San Francisco, Poster)
- 2023 **American Geophysical Union Fall Meeting**, Liu X et al., “A New Era of Air Quality Monitoring from Space over North America with TEMPO: Commissioning and Early Nominal Operation Results” (San Francisco, Talk)
- 2023 **American Geophysical Union Fall Meeting**, Nowlan CR, “Nitrogen dioxide retrievals from the Tropospheric Emissions: Monitoring of Pollution (TEMPO) instrument: First results” (San Francisco, Talk)
- 2023 **American Geophysical Union Fall Meeting**, Mueller S et al., “Small Particles Big Impacts: Using Novel Low-Cost Monitors to Characterize Air Pollution Exposure in Urban Communities” (San Francisco, Talk)

- 2023 **American Meteorological Society Meeting**, Mooers R et al., "Evaluating Tropospheric NO<sub>2</sub> Seasonality and Correlations with Ambient Temperature in the GEOS-CF Model System against TROPOMI Observations over the Contiguous U.S." (Denver CO, Talk)
- 2022 **American Geophysical Union Fall Meeting**, Adams TJ et al., "What Drives Differences in Ground- vs. Satellite-Based Gradients in NO<sub>2</sub> Column Abundance?" (Chicago, Talk)
- 2022 **American Geophysical Union Fall Meeting**, Wang B et al., "Estimating Global Ozone Surface Fluxes and Examining Sensitivity to Input Products and Methodologies" (Chicago, Poster)
- 2022 **American Geophysical Union Fall Meeting**, Raifman et al., "Health Implications of Climate-Forward Investment in Active Transport" (Chicago, Invited Talk)
- 2022 **TEMPO Science Team Meeting**, Wang B. et al., "High Resolution Modeling of NO<sub>2</sub> and O<sub>3</sub> in Greater Boston" (Remote, Poster)
- 2022 **TEMPO Science Team Meeting**, Spinei E et al., "From Street Level to Total Column: Mapping Urban Pollution using Ground-Based DOAS Measurements" (Remote, Poster)
- 2021 **American Geophysical Union Fall Meeting**, Wong AYH et al., "Impact of global climate and land use change on soil reactive nitrogen emissions – implication on air quality" (New Orleans, Talk)
- 2021 **American Geophysical Union Fall Meeting**, Adams TJ et al., "Assessing the spatiotemporal variability of total column NO<sub>2</sub> in Boston observed by TROPOMI and an intra-urban network of Pandoras" (New Orleans, Poster)
- 2021 **American Geophysical Union Fall Meeting**, Wang B et al., "High resolution modeling in a coastal urban environment in support of geostationary retrievals of air quality" (New Orleans, Talk)
- 2021 **American Geophysical Union Fall Meeting**, Santos F et al., "Classifying the diurnal variability in column measurements of NO<sub>2</sub> and implications for geostationary monitoring" (New Orleans, Poster)
- 2021 **American Geophysical Union Fall Meeting**, Murphy JG et al., "Comparison of the NO<sub>x</sub> source from particle nitrate renoxification and soil emissions across North America" (New Orleans, Talk)
- 2021 **Society of Environmental Toxicology and Chemistry**, Rindy J et al., "Quantifying tree exposure to ambient pollutants using passive samplers", (Virtual, Talk)
- 2021 **Community Earth System Model Workshop**, Wong AYH et al., "Impact of global climate and land use change on soil reactive nitrogen emissions: implication on air quality from CESM2.1" (Virtual, Talk)
- 2020 **American Geophysical Union Fall Meeting**, Wong AYH et al., "Quantifying present and future impacts of reactive soil nitrogen emissions on global air quality" (Virtual, Poster)
- 2020 **American Geophysical Union Fall Meeting**, Adams TJ et al., "Reconciling ground-based remote sensing and in-situ observations of COVID-related air quality changes in the Boston area" (Virtual, Poster)
- 2020 **European Geophysical Union General Assembly**, Spinei et al., "Urban air pollution monitoring at micro- local, and meso- scales using Pandora instrument" (Virtual, Talk)

- 2020 **American Meteorological Society Meeting**, Adams TJ et al. “Early results and new insights into tropospheric NO<sub>2</sub> variability from a network of Pandora spectrometers in a coastal urban environment” (Boston MA, Poster)
- 2019 **American Geophysical Union Fall Meeting**, Wong AYH et al., “Constraining ozone dry deposition using ozone and water vapor flux measurements” (San Francisco CA, Poster)
- 2019 **American Geophysical Union Fall Meeting**, Demetillo MAG et al., “Evaluating Air Pollution Inequality Using High-Resolution Nitrogen Dioxide Measurements” (San Francisco CA, Talk)
- 2018 **American Geophysical Union Fall Meeting**, Wong AYH et al., “Long-term Global Multi-physical Modelling of Ozone Dry Deposition Velocity - with Focus on Process Uncertainty and Implication on Air Quality Modelling” (Washington DC, Poster)
- 2018 **American Geophysical Union Fall Meeting**, Demetillo MAG et al., “Assessing Air Pollutant Exposure Inequities Using High-Resolution Nitrogen Dioxide Datasets” (Washington DC, Poster)
- 2018 **American Geophysical Union Fall Meeting**, Chance K et al., “The TEMPO Green Paper: Applications in Air Quality and Health, Agriculture, Forestry, and Economics” (Washington DC, Talk)
- 2017 **American Geophysical Union Fall Meeting**, Pusede SE et al., “On the effects of NO<sub>x</sub> emission control and drought on an ozone-polluted ecosystem” (New Orleans LA, Talk)
- 2017 **Workshop on Ozone Dry Deposition: Constraints from Multiplatform Observations and Multiscale Modeling**, Wong AYH et al., “Effects of rising CO<sub>2</sub> levels on surface ozone through various biogeochemical pathways under different land use scenarios in 21st century” (Lamont-Doherty Earth Observatory NY, Poster)
- 2016 **American Geophysical Union Fall Meeting**, Wong AYH et al., “Effects of land use and land cover change on global ozone air quality in the mid-21st century” (San Francisco CA, Poster)
- 2016 **International Global Atmospheric Chemistry Conference**, Pusede SE et al., “Drought impacts on high ozone in California” (Breckenridge CO, Talk)
- 2015 **American Geophysical Union Fall Meeting**, Silva SJ et al., “Oil Palm expansion over Southeast Asia: land use change and air quality” (San Francisco CA, Poster)
- 2014 **American Geophysical Union Fall Meeting**, Martin RV et al., “Advances in studies of air quality and health informed with satellite remote sensing” (San Francisco CA, Talk)
- 2014 **Urban Environmental Pollution**, Pugliese SC et al., “The impacts of precursor reduction and meteorology on ground-level ozone in the Greater Toronto” (Toronto ON, Talk)
- 2012 **American Geophysical Union Fall Meeting**, Wang et al., “Methane fluxes measured by eddy covariance at a temperate upland” (San Francisco CA, Poster)
- 2012 **American Meteorological Society Meeting, Conference on Atmospheric Biogeosciences**, Petroff A et al., “Dry deposition of particulate nitrogen in a broadleaf forest: The importance of the coarse mode” (Boston MA, Talk)
- 2012 **American Meteorological Society Meeting, Conference on Atmospheric Biogeosciences**, Murphy JG et al., “Methane fluxes measured by eddy covariance at a temperate upland forest in central Ontario” (Boston MA, Talk)

- 2010 **American Meteorological Society Meeting, Conference on Agricultural and Forest Meteorology**, Murphy JG et al., "Monitoring carbon, nitrogen, and particulate matter exchange in a northern hardwood forest subject to high N" (Keystone CO, Poster)
- 2009 **Air and Waste Management Association Symposium on Air Quality Measurements Methods and Technology**, Celarier EA et al., "OMI measurements of NO<sub>2</sub> in the greater Toronto area: Consistency with in situ measurements" (Chapel Hill NC, Talk)
- 2009 **American Geophysical Union Fall Meeting**, McGillen et al., "Field measurements of ammonia in Edinburgh, Scotland between August-September 2008: a comparison between CIMS and QCL techniques" (San Francisco CA, Poster)

**TEACHING:****Department of Earth & Environment, Boston University**

EE 446/646: Remote Sensing of the Atmosphere

EE 540: Atmospheric Chemistry and Global Change

EE 302: Remote Sensing of the Environment

**RESEARCH ADVISING:****Postdoctoral Advisees:**

2021 - Bo Wang

2020 - 2022 Fernando Santos (now research scientist at National University of Singapore)

**Ph.D. Advisees:**

2023 - Claire Naughton

2022 - Rachel Mooers

2019 - Arden C Radford

2018 - 2023 Taylor J Adams (now postdoc at University of Michigan Ann Arbor)

2017 - 2022 Anthony YH Wong (now postdoc at MIT)

**M.A. Advisees:**

2021 - 2022 Jenna Rindy (co-advised with P. Templer, now sustainability specialist at Sibelco Group)

**Undergraduate Advisees:**

2022-2023 Cameron Reimer (Directed Study)

2022-2023 Eleanor Horvath (Directed Study)

2021 Sophie Abou-Rizk (Research Assistant)

2020 Leah Brown (Research Assistant)

2019 Natalie Pienkowska (Directed Study)

2018 Marissa Lee (Work Study)

2017 Sarah Yasenka (UROP)

2017 Shane Devlin (Volunteer)

**Visiting Fellows:**

2017 - 2018 Lei Liu

**THESIS AND DISSERTATION COMMITTEES:****Boston University Ph.D. Dissertation Committees:**

2023 - Charlotte Malmberg (Department of Earth &amp; Environment)

2023 - Sean Mueller (BU School of Public Health)

2023 - Alina McIntyre (BU School of Public Health)

2022 - Laura Buckley (BU School of Public Health)  
 2022 - 2023 Matthew Raifman (BU School of Public Health)  
 2019 - 2023 Sarah Garvey (Department of Earth & Environment)  
 2017 - 2019 Jon Wang (Department of Earth & Environment)  
 2017 - 2019 Jesse Turiel (Department of Earth & Environment)

**External Ph.D. Dissertation Committees**

2022 - Jalal Awan (Pardee RAND Graduate School)

**External Ph.D. Examiner:**

2021 Sabour Baray (York University, Canada)  
 2023 Rimal Abeed (Sorbonne University, France)

**PROFESSIONAL SERVICE: Editorial Activities**

2022 - Editorial Board, *Atmospheric Chemistry and Physics* (N = 17 articles handled)

**PROFESSIONAL SERVICE: Journal Peer Review**

N = 62 verified reviews for the following journals:

<i>ACS Accounts of Chemical Research</i>	<i>ACS Earth and Space Chemistry</i>
<i>Atmosphere</i>	<i>Atmospheric Chemistry &amp; Physics</i>
<i>Atmospheric Environment</i>	<i>Atmospheric Measurement Techniques</i>
<i>Earth's Future</i>	<i>Environment International</i>
<i>Environmental Pollution</i>	<i>Environmental Science &amp; Technology</i>
<i>Environmental Science: Atmospheres</i>	<i>Geophysical Research Letters</i>
<i>Journal of Advances in Modeling Earth Systems</i>	<i>Journal of Applied Meteorology and Climatology</i>
<i>Journal of Geophysical Research: Atmospheres</i>	<i>Nature Climate Change</i>
<i>Nature Communications</i>	<i>Nature Geoscience</i>
<i>PNAS</i>	<i>Remote Sensing of Environment</i>
<i>Science Advances</i>	<i>Science of the Total Environment</i>
<i>Scientific Reports</i>	<i>Urban Climate</i>

**PROFESSIONAL SERVICE: Grant Review****Panel Review:**

2023 NASA Interdisciplinary Research in Earth Science  
 2023 NASA Earth Science Research from Operational Geostationary Satellite Systems  
 2019 NSF PREEVENTS Fire and Drought  
 2017 NASA Atmospheric Composition: Laboratory Research  
 2016 NASA Aura Science Team and Atmospheric Composition Modeling and Analysis

**Ad Hoc Grant Review:**

2023 NSF AGS Postdoctoral Fellowship  
 2022 NSF Physical and Dynamical Meteorology  
 2021 NSF Earth Sciences Instrumentation and Facilities  
 2020 NSF Earth Sciences Instrumentation and Facilities  
 2019 NSF Atmospheric Chemistry CAREER Proposals (N = 5)  
 2018 NERC Centre for Ecology and Hydrology, UK  
 2018 NSF Atmospheric Chemistry  
 2016 NSF Atmospheric Chemistry  
 2015 NOAA Atmospheric Chemistry, Carbon Cycle, and Climate

**PROFESSIONAL SERVICE: International Scientific Community**

- 2022 - WMO GAW Expert Team on Atmospheric Composition Network Design and Evolution  
 2022 - GEOS-Chem Steering Committee and Co-Chair of Surface-Atmosphere-Exchange WG  
 2020 - WMO GAW Steering Committee on Measurement-Model Fusion for Global Total Atmospheric Deposition Initiative  
 2022 Volunteer Judge, American Geophysical Union Outstanding Student Presentation Awards  
 2017 - 2022 GEOS-Chem Steering Committee and Co-Chair of Chemistry-Ecosystem-Climate WG  
 2019, 2020 Co-convener, *Biosphere-Atmosphere Interactions and Atmospheric Chemistry* sessions at the American Geophysical Union Fall Meeting  
 2015 - 2018 Volunteer Judge, American Geophysical Union Outstanding Student Presentation Awards

**PROFESSIONAL SERVICE: Boston University**

- 2023 Faculty Reviewer, Pardee Center Graduate Summer Fellows  
 2022 - Chair, Diversity Equity and Inclusion Committee, Department of Earth & Environment  
 2021 - 2022 Internal Advisory Board Member, BU URBAN  
 2021, 2022 Faculty Reviewer, BU Campus Climate Lab Research Grants  
 2020 - 2022 Diversity Equity and Inclusion Committee, Department of Earth & Environment  
 2018 - 2021 Natural Science Curriculum Committee Member, College of Arts and Science  
 2018, 2019, 2022, 2023 Faculty Judge, Biogeoscience Symposium and Student Research Travel Awards  
 2018 PhD Admissions Committee, Department of Earth & Environment

**FIELD CAMPAIGNS & OTHER TRAINING**

- 2012 Nitrogen oxide fluxes by eddy covariance  
 PROPHET Tower at the University of Michigan Biological Station, Pellston MI  
 2009 – 2013 Greenhouse gas and nitrogen oxide fluxes by eddy covariance  
 Haliburton Forest and Wildlife Reserve Research Tower, Haliburton ON  
 2009 Flux Measurements and Modeling Summer Course  
 University of Colorado Research Station, Nederland CO  
 2008 NitroEurope Ammonia Intercomparison Study  
 Centre for Ecology and Hydrology, Penicuik Scotland

**OTHER RECOGNITION:**

- 2012 Outstanding Student Presentation Award, AGU, Biogeosciences Section  
 2012 Graduate Student Award, University of Toronto Centre for Global Change Science  
 2011 Best Presentation Award, University of Toronto Environmental Chemistry Colloquium  
 2009 Best Student Poster, Canadian Society for Chemistry, Environment Division  
 2009 Chemistry Teaching Fellowship, University of Toronto  
 2008 – 2009 NSERC Canadian Graduate Scholarship (Masters)  
 2008 Ontario Ministry of Environment Graduate Student Endowment Fund  
 2007 Helen Sawyer Hogg Graduate Student Admission Award  
 2007 Undergraduate Internship Award, University of Toronto Center for Global Change Science  
 2006 NSERC Canadian Undergraduate Student Research Award

2005 NSERC Canadian Undergraduate Student Research Award  
2005 Roger E. Dean Memorial Scholarship in Geology