

Journal Articles

- Brown-Steiner, B., Zhou, X., Alvarado, M. J., and Russell, B. T. (2021). Prediction of High-Ozone Events Using GAM, SMOTE, and Tail Dependence Approaches in Texas (2005 – 2019). *Aerosol and Air Quality Research*, 21, 10.
- Donagy, K., Beheshtian., Zhang, Z., and Brown-Steiner, B. (2021). *The Co-evolution of Commodity Flows, Economic Geography, and Emissions*. Springer International Publishing. doi:10.1007/978-3-030-78555-0.
- Hodshire, A. L., Akherati, A., Alvarado, M. J., Brown-Steiner, B., Jathar, S. H., Jimenez, J. L., Kreidenweis, S. M., Lonsdale, C. R., Onasch, T. B., Ortega, A. M., Pierce, J. R., (2019): Aging Effects on Biomass Burning Aerosol Mass and Composition: A Critical Review of Field and Laboratory Studies, *Env. Sci. Tech.*, 53, 17, 10007-10022.
- Sokolov, A., D. Kicklighter, A. Schlosser, C. Wang, E. Monier, B. Brown-Steiner, R. Prinn, C. Forest, X. Gao, A. Libardoni and S. Eastham (2018): Description and Evaluation of the MIT Earth System Model (MESM), *Journal of Advances in Modeling Earth Systems*, 10, 8, 1759-1789, doi:10.1029/2018MS001277.
- Brown-Steiner, B., Selin, N. E., Prinn, R., Tilmes, S., Emmons, L., Lamarque, J.-F., and Cameron-Smith, P. (2018). Evaluating simplified chemical mechanisms within present-day simulations of the Community Earth System Model version 1.2 with CAM4 (CESM1.2 CAM-chem): MOZART-4 vs. Reduced Hydrocarbon vs. Super-Fast Chemistry, *Geosci. Model Dev.*, 11, 4155-4174, <https://doi.org/10.5194/gmd-11-4155-2018>.
- Brown-Steiner, B., Selin, N. E., Prinn, R. G., Monier, E., Tilmes, S., Emmons, L., and Garcia-Menendez, F. (2018). Maximizing Ozone Signals Among Chemical, Meteorological, and Climatological Variability. *Atmos. Chem. Phys.*, 18, 8373-8388.
- Evensen, D., Brown-Steiner, B. (2017). Public perception of the relationship between climate change and unconventional gas development ('fracking') in the US. *Climate Policy*, 1-12.
- Evensen, D., Stedman, R., and Brown-Steiner, B. (2017). Resilient but not sustainable? Public perceptions of shale gas development via hydraulic fracturing. *Ecology and Society*, 22, 1, 8.
- Zabel, I. H. H. and Brown-Steiner, B. (2017). Chapter 6: US Regional Climates, Current and Future. In *The Teacher-Friendly Guide to Climate Change*, eds. Zabel, I. H. H., Duggan-Haas, D., and Ross, R. R. Paleontological Research Institute, Special Publication No. 53.
- Brown-Steiner, B., Hess, P., Chen, J., and Donaghy, K. (2016). Black carbon emissions from trucks and trains in the Midwestern and Northeastern United States from 1977 to 2007. *Atmospheric Environment*, 129, 155-166.
- Brown-Steiner, B., Chen, J., and Donaghy, K. (2015). The Evolution of Freight Movement and Associated Non-Point Source Emissions in the Midwest-Northeast Transportation Corridor of the United States, 1977 – 2007. In: *The Region and Trade: New Analytical Directions*. Batabyal, P.A. and Nijkamp, P. (eds).
- Brown-Steiner, B., Hess, P., and Lin., M.Y. (2015). On the capabilities and limitations of GCM simulations of summertime regional air quality: A diagnostic analysis of ozone and temperature simulations in the US using CESM CAM-Chem. *Atmospheric Environment*, 101, 134-148.

- Tang, Q., Hess, P.G., Brown-Steiner, B., and Kinnison, D.E. (2013). Tropospheric ozone decreases due to the Mount Pinatubo eruption: Reduced stratospheric influx. *Geophysical Research Letters*, 40, 30.
- Brown-Steiner, B., and Hess, P. (2011). Asian influence on surface ozone in the United States: A comparison of chemistry, seasonality, and transport mechanisms, *Journal of Geophysical Research: Atmospheres*, 116, D17309.
- Hess, P., Johnston, M., Brown-Steiner, B., Holloway, T., de Andrade, J.B., and Artaxo, P. (2009). Air quality issues associated with biofuel production and use. Pages 169-194 in R.W. Howarth and S. Bringezu (eds) *Biofuels: Environmental Consequences and Interactions with Changing Land Use*. Proceedings of the Scientific Committee on Problems of the Environment (SCOPE) International Biofuels Project Rapid Assessment, 22-25 September 2008, Gummersbach Germany. Cornell University, Ithaca NY, USA.

Meeting Presentations, Webinars, and Conference Proceedings

- Brown-Steiner, B. (2024). Climate modeling: How do we predict? presentation at the Teaching Climate Change Workshop at the Museum of the Earth, Ithaca, New York, August 2024.
- Brown-Steiner, B. (2024). Climate Model Ensembles: Why they are complicated, valuable, and fascinating. Virtual workshop for the Paleontological Research Institute. Recording available here: <https://www.youtube.com/live/ANjBvYhA-L4>. May 22, 2024.
- Brown-Steiner, B. (2022) NSF-GEO. Presentation for the Federal Funding Opportunities Panel at the 27th NSF EPSCoR National Conference, Portland, Maine, November 15, 2022.
- Brown-Steiner, B. (2022) NSF and EPSCoR. Presentation at the New Hampshire BioMade All-Team Meeting, Keene State College, Keene, New Hampshire, October 14, 2022.
- Brown-Steiner, B. (2022). Sampling from the Atmospheric Chemistry Smörgåsbord. Presentation at Clarkson University (virtual), Institute for a Sustainable Environment, Center for Atmospheric and Aquatic Resources Engineering and Science, May 24, 2022.
- Brown-Steiner, B., Dayalu, A., Alvarado, M. J., Ashok, A., and Connor, T. (2021) A Machine Learning Approach for Identifying Smoke Plumes Based on GOES Satellite Observations Over the United States Trained on the Hazard Mapping System Fire and Smoke Product. Poster presentation at the 2021 International Global Atmospheric Chemistry (IGAC) Science Conference. Virtual.
- Brown-Steiner, B., Alvarado, M. J., Xiong, Z., and Russel, B.T. (2021) Using Surface Observations to Select Features and Predict Extreme Ozone in Texas via Generalized Additive Modeling, Synthetic Minority Oversampling Technique (SMOTE), Tail Dependence Optimization Method. Presentation at the 2021 Air & Waste Management Association's 114th Annual Conference and Exhibition, June 14-16, 2021.
- Brown-Steiner, B. (2020). From the Classroom to My Bedroom: How Teaching the Science of Climate Change and Emissions via Informal Community Education Differs Between In-Person and Virtual Classrooms. Poster presentation at the 2020 American Geophysical Union (AGU) Fall Meeting, December 1-17, 2020.
- Brown-Steiner, B., Zhou, X., Alvarado, M.J. (2020). Using Surface Observations to Select Features and to Predict Extreme Ozone in Texas via Generalized Additive Modeling (GAM), the Synthetic Minority

- Oversampling Technique (SMOTE), and a Tail Dependence Optimization Method. Poster presentation at the 2020 American Geophysical Union (AGU) Fall Meeting, December 1-17, 2020.
- Brown-Steiner, B., Alvarado, M. J., Joo, T., Ng, N. L., Jiang, J., and Barsanti, K. (2020). Modeling of Furan Oxidation (via OH and NO₃) within Biomass-Burning Regimes Based on New Results from Chamber Experiments. Presentation at the 2020 American Association for Aerosol Research (AAAR) 38th Annual Online Conference, October 5-9, 2020.
- Brown-Steiner, B., Alvarado, M. J., Jiang, J., and Barsanti, K. (2020). Incorporation of a Detailed Gas-Phase Furan Mechanism into a Young Biomass Burning Plume Box Model. Presentation at the 2020 Atmospheric Chemical Mechanism Conference, November 9-20, 2020.
- Brown-Steiner, B., Alvarado, M. J., Cady-Pereira, K. E., Zhou, X. (2019). Clustering Algorithms Provide Answers, but How Do You Know When You've Found the Answer? Poster presentation at the 2019 American Geophysical Union (AGU) Fall Meeting, December 9 – 13, 2019.
- Brown-Steiner, B. (2019). Lessons Learned in Climate Communication: From the Formal to the Informal, the Few to the Many, the Young to the Old. eLightning presentation at the 2019 American Geophysical Union (AGU) Fall Meeting, December 9 – 13, 2019.
- Brown-Steiner, B., Alvarado, M., Ng, N.L., Joo, Taekyu. (2019). Development of furan oxidation mechanism from OH and NO₃ oxidation within biomass-burning regimes via chamber experiments. American Association of Aerosol Research (AAAR), Portland, Oregon, October 14 – 18, 2019.
- Brown-Steiner, B., Alvarado, M., Ng, N.L., Joo, Taekyu. (2019). Development of furan oxidation mechanism from OH and NO₃ oxidation within biomass-burning regimes via chamber experiments. Gordon Research Conference (GRC): Atmospheric Chemistry, Newry, Maine, July 28 – August 2, 2019.
- Brown-Steiner, B., Alvarado, M., Ng, N.L., Joo, Taekyu. (2018). Development of furan oxidation mechanism from OH and NO₃ oxidation within biomass-burning regimes via chamber experiments. Atmospheric Chemical Mechanism (ACM) Conference, UC Davis, Davis, California, December 5 – 7, 2018.
- Brown-Steiner, B., Selin, N. E., Prinn, R., Tilmes, S., Emmons, L., Lamarque, J.-F., Cameron-Smith, P., Monier, E., and Garcia-Menendez, F. (2018). Lessons Learned from using simplified chemical mechanisms, and new paths forward. 2018 CESM Summer Working Group Meeting, Boulder, Colorado.
- Brown-Steiner, B., Selin, N. E., Prinn, R., Tilmes, S., Emmons, L., Lamarque, J.-F., and Cameron-Smith, P., Monier, E., and Garcia-Menendez, F. (2017). How I Learned to Stop Worrying and Love Simplified Chemical Mechanisms. Cornell University Special Topics in Earth and Atmospheric Sciences, Atmospheric Science Seminar, April 19, 2018. <https://globalchange.mit.edu/media/how-i-learned-stop-worrying-and-love-simplified-chemical-mechanisms>.
- Brown-Steiner, B., Selin, N. E., Prinn, R., Tilmes, S., Emmons, L., Lamarque, J.-F., and Cameron-Smith, P., Monier, E., and Garcia-Menendez, F. (2017). How I Learned to Stop Worrying and Love Simplified Chemical Mechanisms. Massachusetts Institute of Technology, Center for Global Change Science Lunch Seminar, November 3, 2017.
- Brown-Steiner, B. Climate Science in Context. An introduction to climate science as it applies to Faith Lutheran Church in Quincy, Massachusetts. May 10, 2017.

- Brown-Steiner, B., Selin, N., Prinn, R., Monier, E., Tilmes, S., Emmons, L., Garcia-Menendez, F., and Cameron-Smith, P. (2017). Leveraging Mechanism Simplicity and Strategic Averaging to Identify Signals from Highly Heterogeneous Spatial and Temporal Ozone Data. Poster at the 2017 AGU Fall Meeting, New Orleans, Louisiana.
- Brown-Steiner, B. (2017). To Know, or Not to Know - Why it is Important to Understand Both What We Know, and What We Don't Know, When Studying Our Air and Sky. Presentation at the Sharing Science Upgoer5 Session at the 2017 AGU Fall Meeting, New Orleans, Louisiana. Available at <https://www.youtube.com/watch?v=WF0HbPscQgE&t=1568s>.
- Brown-Steiner, B.; Selin, N.; Prinn, R.; Emmons, L.; and Tilmes, S. (2017). Using superfast chemistry to emulate MOZART within the CESM CAM-Chem: Strengths, weaknesses, and possibilities. 2017 CESM Winter Working Group Meeting, Boulder, Colorado.
- Brown-Steiner, B. Climate Change in Pepperell. Presented to the Pepperell Democratic Town Committee, May 22, 2017.
- Brown-Steiner, B.; Selin, N.; and Prinn, R. (2016). The Square Root of Cat: Better Chemistry Through Simplicity? MIT AtmosChem Fall Seminar. Cambridge, Massachusetts.
- Brown-Steiner, B. (2016). 2016: A Chemical Odyssey? Joint Program Science Meeting, Cambridge, Massachusetts.
- Brown-Steiner, B. (2016). Atmospheric Chemistry within the MESM Framework. MESM Science Retreat. Boston, Massachusetts.
- Brown-Steiner, B., Selin, N., Prinn, R., Monier, E., Mulvaney, K., Emmons, L., Tilmes, S. (2016). Parametric and Structural Uncertainties Related of Air Pollution and Human Health. Poster at the 2016 International Global Atmospheric Chemistry (IGAC) Science Conference. Breckenridge, Colorado.
- Brown-Steiner, B.; Selin, N.; Prinn, R.; Monier, E.; Mulvaney, Katie; Emmons, L.; Tilmes, S. (2016). Parametric and Structural Uncertainties Related to Air Pollution and Human Health: Influence of Resolution, Chemical Mechanism, Meteorology, and Model (CESM CAM-Chem and GEOS-Chem). 2016 CESM Summer Working Group Meeting. Breckenridge, Colorado.
- Brown-Steiner, B.; Selin, N.; Prinn, R.; Monier, E.; Emmons, L.; Tilmes, S. (2016). Comparison of Chemical Mechanisms. 2016 CESM Winter Working Group Meeting. Boulder, Colorado.
- Brown-Steiner, B., Hess, P., Mahowald, N., Donaghy, K., Lin, M., Ma, P.-L., Wang, H. (2015). Adventures in Climate Modeling. Seminar for the Massachusetts Institute of Technology Joint Program and the Science and Policy of Global Change.
- Brown-Steiner, B. Introduction to the Science of Climate Change. Guest Lecturer at the Tompkins County Community College (TC3) Climate Economics class taught by Patrick Sewell, February 2015.
- Brown-Steiner, B., Hess, P., Chen, J.; and Donaghy, K. (2015). A New Framework for Estimating Black Carbon Emissions from Truck and Rail Freight Transportation in the Midwestern and Northeastern US from 1977 – 2007. Presented at the Atmospheric Science & Global Change Division Seminar at the Pacific Northwest National Laboratory, Richland, WA.
- Brown-Steiner, B. (2014). Climate Science in Context. Presentation at the local Interfaith Climate Justice Inquiry into Action Group in Ithaca, NY.

- Brown-Steiner, B. and Hess, P. (2014). The Impact of Changing Surface Transportation on Northeast US Chemical Weather and Chemical Climate. Presentation at the American Meteorological Society Conference on Atmospheric Chemistry at the 2014 Annual Meeting.
- Brown-Steiner, B. (2013). Tracing the Steps of Those That Built Climate Models, and How They Used Venus and Mars along the Way. Presentation at the Department of Astronomy Planetary Lunch Seminar at Cornell University.
- Brown-Steiner, B. and Hess, P. (2012). Air Quality in the Eastern US: A Diagnostic Analysis of Present-Day Conditions using various CESM CAM-Chem configurations. Poster at the American Geophysical Union 2012 Fall Meeting.
- Brown-Steiner, B. and Hess, P. (2012). Regional and Global Changes to Air Quality in the Eastern US: modeling the present and future state of atmospheric climate and chemistry. Poster at the Biological and Environmental Engineering Department Research Symposium at Cornell University.
- Brown-Steiner, B. (2011). Asian influence on surface ozone in the United States: a comparison of regional chemistry, seasonality, and transport mechanisms. Presentation at Biological and Environmental Engineering Department Research Symposium at Cornell University.
- Brown-Steiner, B. and Hess, P. (2010). Asian Impact on surface ozone in the western United States: Chemistry, Seasonality, and Transport Mechanisms. Presentation at the American Geophysical Union 2010 Fall Meeting.
- Brown-Steiner, B. (2010). Climate Models - A crash course on their history, their current state, and one specific project. Presentation at the Department of Astronomy Planetary Lunch Seminar at Cornell University.
- Brown-Steiner, B. and Hess, P. (2010). Influence of Asian emissions on surface ozone in the United States: Seasonality, variation, and distribution. Poster at the Biological and Environmental Engineering Department Research Symposium at Cornell University.

Formal Reports

- Brown-Steiner, B., Dayalu, A., Alvarado, M. J., Ashok, A., and Connor, T. (2021). Wildfire Smoke Tracking Algorithm: Brief Technical Memo to Texas Commission on Environmental Quality (TCEQ) for Work Order No. 582-21-22400-007 under TCEQ Contract No. 582-19-90498, June 30, 2021.
- Brown-Steiner, B. and Alvarado, M. (2020). Review of Satellite Capabilities for Observations of Surface-Level Concentrations and Emissions. Report prepared for the Electric Power Research Institute (EPRI), August 4, 2020.
- Brown-Steiner, B., Zhou, X., and Alvarado, M. (2020), Improved Fit of Generalized Additive Models (GAMs), Final Report to Texas Commission on Environmental Quality (TCEQ) for Work Order No. 582-20-12403-005 under TCEQ Contract No. 582-19-90498, July 29, 2020.
- Brown-Steiner, B., Dayalu, A., and Alvarado, M. (2019), Uncertainty analysis and improvement of STILT-ASP for determining O₃ formation from biomass burning, Final Report to Texas Commission on Environmental Quality (TCEQ) for Work Order No. 582-19-92805-03 under TCEQ Contract No. 582-19-90498, June 28, 2019.

Brown-Steiner, B., Hegarty, J., Mountain, M., and Alvarado, M. (2019), Separation of Poor Air Quality Events in El Paso, Texas Based on Dominant Sources of Emissions, Final Report to Texas Commission on Environmental Quality (TCEQ) for Work Order No. 582-19-92805-02 under TCEQ Contract No. 582-19-90498, June 28.

Brown-Steiner, B., McVey, A., and Alvarado, M. (2019), Improving Spatial Resolution of Emissions in Mexico, Final Report to Texas Commission on Environmental Quality (TCEQ) for Work Order No. 582-19-91394-01 under TCEQ Contract No. 582-19-90498, June 20.