

Journal Articles

- Coughlin J.G., Clark C.M., Pardo L.H., Sabo R.D., and Ash J.D. (2023) Sensitive tree species remain at risk despite improved air quality benefits to US forests. *Nature Sustainability*, doi: 10.1038/s41893-023-01203-8, August 21. Available at <https://doi.org/10.1038/s41893-023-01203-8>.
- Coughlin J.G., Elliott E.M., Rose L.A., Pekney N.J., and Reeder M. (2020) Quantifying atmospheric reactive nitrogen concentrations, dry deposition, and isotope dynamics surrounding a Marcellus Shale well pad. *Atmospheric Environment*, 223(117196). Available at <https://www.sciencedirect.com/science/article/abs/pii/S1352231019308350>.
- Walker J.T., Beachley G., Amos H.M., Baron J.S., Bash J., Baumgardner R., Bell M.D., Coughlin J.G., and others (2019) Toward the improvement of total nitrogen deposition budgets in the United States. *Science of The Total Environment*, 691, 1328-1352, November 15. Available at <https://www.sciencedirect.com/science/article/pii/S0048969719331717>.
- Elliott E.M., Yu Z., Cole A.S., and Coughlin J.G. (2019) Isotopic advances in understanding reactive nitrogen deposition and atmospheric processing. *Science of The Total Environment*, 662, 393-403, April 20. Available at <https://www.sciencedirect.com/science/article/pii/S004896971835023X>.
- Coughlin J.G., Yu Z., and Elliott E.M. (2017) Efficacy of passive sampler collection for atmospheric NO₂ isotopes under simulated environmental conditions. *Rapid Communications in Mass Spectrometry*, 31(4), 1211-1220. Available at <https://analyticalsciencejournals.onlinelibrary.wiley.com/doi/abs/10.1002/rcm.7885>.
- Coughlin J.G., Rose L.A., Bain D.J., and Elliott E.M. (2017) The influence of Marcellus Shale extraction emissions on regionally monitored dry reactive nitrogen deposition. *Environ. Sci. Technol.*, 51(6), 3542-3549. Available at <https://pubs.acs.org/doi/abs/10.1021/acs.est.6b05933>.

White Papers

- Coughlin J.G., Pavlovic N.R., and Vijayan A. (2022) Satellite Remote Sensing of Methane. White paper prepared for Electric Power Research Institute (EPRI), Palo Alto, CA by Sonoma Technology, Petaluma, CA, STI-922062-7827, December 2.
- Walker, J.T., Beachley, G.M., Amos, H.M., Baron, J.S., Bash, J., Baumgardner, R., Bell, M.D., Benedict, K.B., Chen, X., Clow, D.W., Cole, A., Coughlin, J.G., Cruz, K., Daly, R.W., Decina, S.M., Elliott, E.M., Fenn, M.E., Ganzeveld, L., Gebhart, K., Isil, S.S., Kerschner, B.M., Larson, R.S., Lavery, T., Lear, G.G., Macy, T., Mast, M.A., Mishoe, K., Morris, K.H., Padgett, P.E., Pouyat, R.V., Puchalski, M., Pye, H.O.T., Rea, A.W., Rhodes, M.F., Rogers, C.M., Saylor, R., Scheffe, R., Schictel, B.A., Schwede, D.B., Sexstone, G.A., Sive, B.C., Templer, P.H., Thompson, T., Tong, D., Wetherbee, G.A., Whitlow, T.H., Wu, Z., Yu, Z., Zhang, L. (2019) Science needs for continued development of total nitrogen deposition budgets in the United States. *U.S. Environmental Protection Agency*, Washington, DC, EPA 601/R-19/001. <https://www.fs.usda.gov/treesearch/pubs/58778>

Meeting Presentations, Webinars, and Conference Proceedings

- Pavlovic N., Chan A., Coughlin J., King D., Knowland E., and Malings C. (2023) Data Fusion with Uncertainty Quantification for Sub-City-Scale Assessments and Forecasting of PM_{2.5} and Trace Gases. Presentation

given at *American Association for Aerosol Research 41st Annual Conference, Portland, OR, October 2-6*, by Sonoma Technology, Petaluma, CA. STI-7904.

- Scarborough, C., Spada, N., Coughlin, J., Winegar, E., Jones, T., Marcotte, A., Pavlovic, N., Vijayan, A., Snyder, J.L., Yang, D., Chin, K. (2023) Neighborhood-scale Air Quality Mapping in Sacramento Communities Using a Research Grade Mobile Platform. Presentation given at the *13th International Conference on Carbonaceous Particles in the Atmosphere, Berkeley, CA. July 9-12*, by Sonoma Technology, Petaluma, CA. STI-7891.
- Coughlin J., Chang S.Y., Pavlovic N.R., Huang J., Craig K.J., Scarborough C., and Driscoll C.T. (2023) Spatially varying nitrogen critical loads and the influences of mediating factors. Presentation given at the *NADP Spring Meeting, Madison, WI, May 1-5*, by Sonoma Technology, Petaluma, CA. STI-7898.
- Liangou, A., Tasoglou, A., Coughlin, J.G., Silva, L.P., Haile, K., Acosta, R. (2022) A Comparison of a PTR-ToF-MS Against Four Other VOC Measurement Methods Using Standardized Techniques During Fence-line Monitoring in Four States. Poster given at *2022 American Geophysical Union Conference, November 2022*.
- Chang S.Y., Coughlin J.G., Huang J., Craig K.J., Herrick J., Driscoll C.T., and Pavlovic N.R. (2022) Empirical critical levels of ozone for U.S. tree species and their uncertainties using machine learning. Poster presented at the *American Geophysical Union (AGU) Fall Meeting, Chicago, IL, December 12-16*, by Sonoma Technology, Petaluma, CA. STI-7771.
- Pardo, L.H., Clark, C.M., Ash, J., Coughlin, J.G., Sabo, R.D. (2022) Re-assessing risk from nitrogen and sulfur deposition to forest ecosystems across the continental US. Presentation given at *2022 National Atmospheric Deposition Program Conference, November 2022*.
- Chang S.Y., Pavlovic N.R., Coughlin J., Huang J., Craig K.J., Scarborough C., Horn K., Driscoll C.T., and Herrick J. (2022) Empirical critical levels of ozone for U.S. tree species and their uncertainties with machine learning. Presentation given at the *National Atmospheric Deposition Program 2022 Science Symposium, Knoxville, TN, November 17*, by Sonoma Technology, Petaluma, CA, the Freedom Consulting Group, Columbia, MD, and the Syracuse University Department of Civil and Environmental Engineering, Syracuse, NY. STI-7769.
- Pavlovic N.R., Coughlin J.G., Chang S., Huang J., Craig K.J., Scarborough C., Horn K., and Driscoll C.T. (2022) Mapping variability of nitrogen critical loads using machine learning. Poster presented at the *2022 National Atmospheric Deposition Program Conference, Knoxville, TN, November 14-18*, by Sonoma Technology, Petaluma, CA, the Freedom Consulting Group, Columbia, MD, and the Syracuse University Department of Civil and Environmental Engineering, Syracuse, NY. STI-7770.
- Clark, C.M., Bell, M., Coughlin, J.G., Pardo, L., Lynch, J., Dalton, R., McDonnell, T., Miller, J., Pavlovic, N. (2022) Current and future uses of MMF TDep data for biodiversity assessments. Webinar given to *2022 World Meteorological Organization – Global Atmosphere Watch Measurement-Model Fusion Symposium, August 2022*.
- Tasoglou, A., Coughlin, J.G., Silva, L.P., Haile, K., Acosta, R. (2022) A comparison of a PTR-ToF-MS against four other VOC measurement methods using standardized techniques during fence-line monitoring in four states. Presentation given at *2022 National Ambient Air Monitoring Conference, August 2022*.

- Coughlin, J.G., Tasoglou, A., Silva, L.P., Haile, K., Acosta, R. (2022) A comparison of a PTR-ToF-MS against four other VOC measurement methods using standardized techniques during fence-line monitoring in four states. Presentation given at *2022 Air Sensors International Conference, May 2022*.
- Tasoglou, A., Coughlin, J.G., Silva, L.P., Haile, K., Acosta, R. (2022) A comparison of a PTR-ToF-MS against four other VOC measurement methods. Presentation given at *ASTM International Workshop on Ambient Air Fenceline Monitoring Using Advanced Monitoring Technologies, April 2022*.
- Bell, M. D., Pardo, L., Clark, C.M., Lynch, J., Geiser, L., Ash, J., Smith, R., Felker-Quinn, E., Coughlin, J.G. (2021) Using critical loads of N for lichens, trees, and herbaceous plants to determine risk to ecosystem health in federal lands. Poster given at *2021 American Geophysical Meeting, December 2021*.
- Coughlin, J.G., (2021) Lead (Pb) emissions source targeting techniques for ambient air quality investigations. Webinar presented to the *US Environmental Protection Agency Lead (Pb) National Workgroup, August 2021*.
- Coughlin, J.G., Pardo, L. (2021) Critical loads of nitrogen and sulfur for tree growth and survival. Webinar presented to the *Critical Loads in Atmospheric Deposition Committee, March 2021*.
- Sabo, R.D., Clark, C.M., Horn, K.J., Coughlin, J.G., Ash, J., Pardo, L., Smith, T.J., Thomas, R.Q. (2019) Evaluating the impact of species diversity on resilience of forest growth and survival to acidic deposition. Poster given at *National Atmospheric Deposition Program 2019 Meeting, November 2019*.
- Coughlin, J.G., Clark, C.M., Sabo, R.D., Ash, J., James, J., Smith, T.J., Pardo, L. (2019) Determining adequate levels of nitrogen and sulfur deposition to prevent harmful tree species level decreases. Poster given at *National Atmospheric Deposition Program 2019 Meeting, November 2019*.
- Pardo, L.H., Horn, K.J., Clark, C.M., Thomas, R.Q., Sabo, R.D., Ash, J., Bell, M.D., Coughlin, J.G., James, J. (2018) Assessing risk to forest ecosystems from nitrogen and sulfur deposition across the continental US. Presentation given at *2018 National Atmospheric Deposition Program Conference, November 2018*.
- Coughlin, J.G., Fuoco, M., Hamilton, S. (2017) The Geospatial Monitoring of Air Pollutants (GMAP) and its role in addressing critical knowledge gaps in air quality and source emissions. Poster given at *National Atmospheric Deposition Program 2017 Meeting, November 2017*.
- Coughlin, J.G., Rose, L., Pekney, N., Elliott, E.M. (2016) Reactive nitrogen emission from the Marcellus Shale natural gas activity and implications for regional deposition. Poster given at *96th Annual American Meteorological Society Meeting, January 2016*.
- Coughlin, J.G., Rose, L., Elliott, E.M. (2015) Reactive nitrogen emissions from unconventional natural gas well pads and implications for regional NO_x emission inventories. Poster given at *9th International Conference on Acid Deposition, October 2015*.
- Coughlin, J.G., Pompeani, D.P., Hillman, A.L., Abbott, M.B. (2014) An 850-year record of human and environmental change near the Mississippian-era city of Moundville (Alabama) from lake sediment geochemistry. Poster given at *Geological Society of America's 49th Northeastern Annual Meeting, March 2014*.

Formal Reports

Marrero J., Schill S.R., and Coughlin J. (2023) Tesoro Refining & Marketing Company, LLC (a subsidiary of Marathon Petroleum Corporation) rule 1180 fenceline monitoring Q1 report: January 2023–March 2023. Quarterly report prepared for Tesoro Refining and Marketing Company, LLC, Carson, CA, by Sonoma Technology, Petaluma, CA, STI-7918, May.

Marrero J.E., Schill S.R., Scarborough C., and Coughlin J. (2022) Tesoro Refining & Marketing Company, LLC (a subsidiary of Marathon Petroleum Corporation) rule 1180 fenceline monitoring Q3 report: July 2022–September 2022. Quarterly report prepared for Tesoro Refining & Marketing Company LLC, Martinez, CA by Sonoma Technology, Petaluma, CA, STI-922018-7817, November 21.

Elliott E.M., Coughlin J.G., and Rose L. (2015) Data report for monitoring background ambient air concentrations of reactive nitrogen compounds using passive sampling techniques. Report prepared for the U.S. Department of Energy, Office of Fossil Energy by the University of Pittsburgh, PA, June 2015.