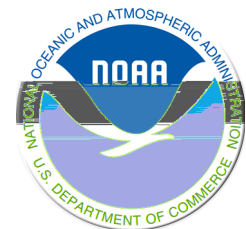
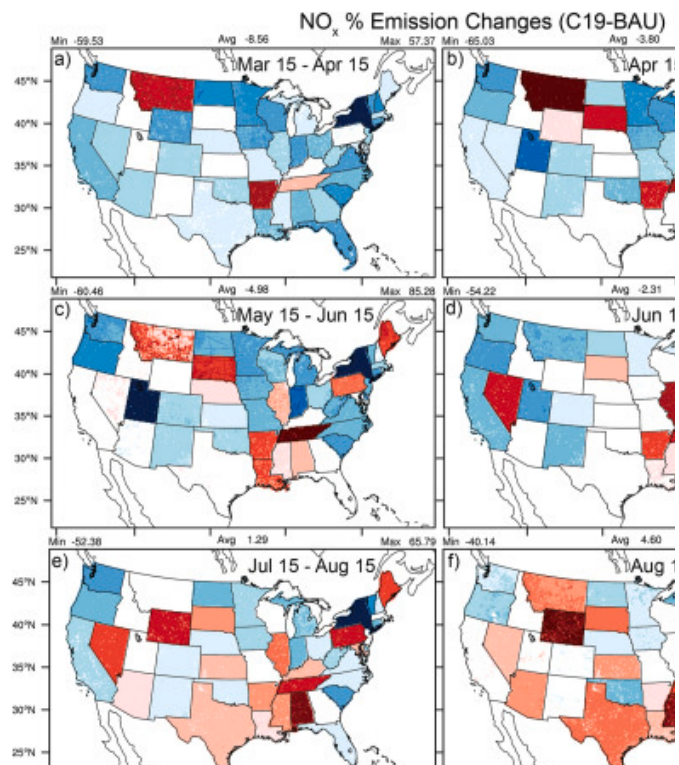


Air Resources Laboratory

Publications 2021



Q1

1. Angevine, W. M., Peischl, J., Crawford, A., Loughner, C. P., Pollack, I. B., and Thompson, C. R.: Errors in top-down estimates of emissions using a known source, *Atmos. Chem. Phys.*, 20, 11855–11868, <https://doi.org/10.5194/acp-20-11855-2020>
2. Bae, M., B.-U. Kim, H.C. Kim, J. Kim, and S. Kim, Role of emissions and meteorology in the recent PM_{2.5} changes in China and South Korea from 2015 to 2018, *Environmental Pollution*, 270(2021) 116233, [doi:10.1016/j.envpol.2020.116233](https://doi.org/10.1016/j.envpol.2020.116233), 2021
3. Benish, S. E., He, H., Ren, X., Roberts, S. J., Salawitch, R. J., Li, Z., Wang, F., Wang, Y., Zhang, F., Shao, M., Lu, S., and Dickerson, R. R.: Measurement report: Aircraft observations of ozone, nitrogen oxides, and volatile organic compounds over Hebei Province, China, *Atmos. Chem. Phys.*, 20, 14523–14545, <https://doi.org/10.5194/acp-20-14523-2020>, 2020.
4. Buban, M. S., Lee, T. R., and Baker, C. B. (2020). A Comparison of the U.S. Climate Reference Network Precipitation Data to the Parameter-Elevation Regressions on Independent Slopes Model (PRISM), *Journal of Hydrometeorology*, 21(10), 2391-2400. Retrieved Dec 15, 2020, from <https://journals.ametsoc.org/view/journals/hydr/21/10/jhmD190232.xml> <https://doi.org/10.1175/JHM-D-19-0232.1>
5. Crawford, A. The Use of Gaussian Mixture Models with Atmospheric Lagrangian Particle Dispersion Models for Density Estimation and Feature Identification. *Atmosphere* 2020, 11, 1369. <https://doi.org/10.3390/atmos11121369>
6. Gaubert, B., Emmons, L. K., Raeder, K., Tilmes, S., Miyazaki, K., Arellano Jr., A. F., Elguindi, N., Granier, C., Tang, W., Barré, J., Worden, H. M., Buchholz, R. R., Edwards, D. P., Franke, P., Anderson, J. L., Saunio, M., Schroeder, J., Woo, J.-H., Simpson, I. J., Blake, D. R., Meinardi, S., Wennberg, P. O., Crouse, J., Teng, A., Kim, M., Dickerson, R. R., He, H., Ren, X., Pusede, S. E., and Diskin, G. S.: Correcting model biases of CO in East Asia: impact on oxidant distributions during KORUS-AQ, *Atmos. Chem. Phys.*, 20, 14617–14647, <https://doi.org/10.5194/acp-20-14617-2020>, 2020
7. Hicks, B.B., Pendergrass, W.R., Oetting, J., O'Dell, D.L. and Eash, N.S. The North American Solar Eclipse of 2017: Observations on the Surface Biosphere, Time Responses and Persistence. *Boundary-Layer Meteorol* (2020). <https://doi.org/10.1007/s10546-020-00582-1>
8. Kang, YH., You, S., Bae, M., Kim, E., Son K., Bae, C., Kim, Y., Kim, B-U, Kim HC, Kim, S. The impacts of COVID-19, meteorology, and emission control policies on PM_{2.5} drops in Northeast Asia. *Sci Rep* 10, 22112 (2020). <https://doi.org/10.1038/s41598-020-79088-2>
9. Pendergrass W., Lichiheb N, White R., Hicks, B., Myles L. High-Resolution Meteorological Monitoring over the National Capital Region: Data from the DCNet Network at the US Department of Commerce Herbert C. Hoover Building Station. NOAA OAR TM-280. <https://doi.org/10.25923/x84t-w816>
10. Salinger, MJ., Diamond, H.J., and Renwick, J.A.. Surface temperature trends and variability in New Zealand and surrounding oceans: 1871-2018. *Weather and Climate*, 12/2/2020.
11. Shi, X., Ge, Y., Zheng, J., Ma, Y., Ren, X., Zhang, Y. Budget of nitrous acid and its impacts on atmospheric oxidative capacity at an urban site in the central Yangtze River Delta region of China, *Atmospheric Environment*, Volume 238, 2020,v117725, ISSN 1352-2310, <https://doi.org/10.1016/j.atmosenv.2020.117725>.
12. Wang, L., Yu, S., Li, P., Chen, X., Li, Z., Zhang, Y., Li, M., Mehmood, K., Liu, W., Chai, T., Zhu, Y., Rosenfeld, D., and Seinfeld, J. H.: Significant wintertime PM_{2.5} mitigation in the Yangtze River Delta, China, from 2016 to 2019: observational constraints on anthropogenic emission controls, *Atmos. Chem. Phys.*, 20, 14787–14800, <https://doi.org/10.5194/acp-20-14787-2020>, 2020

Q2

13. Chen, X., Zhang, Y., Wang, K., Tong, D., Lee, P., Tang, Y., Huang, J., Campbell, P. C., Mcqueen, J., Pye, H. O. T., Murphy, B. N., and Kang, D.: Evaluation of the offline-coupled GFSv15–FV3–CMAQv5.0.2 in support of the next-generation National Air Quality Forecast Capability over the

- contiguous United States, *Geosci. Model Dev.*, 14, 3969–3993, <https://doi.org/10.5194/gmd-14-3969-2021>, 2021.
14. Chen, Y., Shen, H., Kaiser, J., Hu, Y., Capps, S. L., Zhao, S., Hakami, A., Shih, J.-S., Pavur, G. K., Turner, M. D., Henze, D. K., Resler, J., Nenes, A., Napelenok, S. L., Bash, J. O., Fahey, K. M., Carmichael, G. R., Chai, T., Clarisse, L., Coheur, P.-F., Van Damme, M., and Russell, A. G.: High-resolution hybrid inversion of IASI ammonia columns to constrain US ammonia emissions using the CMAQ adjoint model, *Atmos. Chem. Phys.*, 21, 2067–2082, <https://doi.org/10.5194/acp-21-2067-2021>, 2021.
 15. Hicks, B.B., Lichiheb, N., O'Dell, D.L., Oetting, J., Eash, N.S., Heuer, M., and Myles, L. A statistical approach to surface renewal: The virtual chamber concept. *Agrosyst Geosci Environ.* 2021; 4:e20141. <https://doi.org/10.1002/agg2.20141>
 16. Kim, B-U., H.C. Kim, S. Kim: Effects of Vertical Turbulent Diffusivity on Regional PM2.5 and O3 source Contributions, *Atmospheric Environment*, 245 (2021) 118026, <https://doi.org/10.1016/j.atmosenv.2020.118026>, 2021
 17. Kim, E., Kim, B-U., Kim, H.C., and Kim, S. Direct and cross impacts of upwind emission control on downwind PM2.5 under various NH3 conditions in Northeast Asia, *Environmental Pollution*, 268 (2021) 115794, [doi:10.1016/j.envpol.2020.115794](https://doi.org/10.1016/j.envpol.2020.115794), 2021
 18. Kim, E., Kim, B.-U., Kim, H.C., and Kim, S. Sensitivity of Fine Particulate Matter Concentrations in South Korea to Regional Ammonia Emissions in Northeast Asia, *Environmental Pollution*, 273 (2021) 116428, <https://doi.org/10.1016/j.envpol.2020.115794>
 19. Lee, T. R. and Pal, S.: The impact of height-independent errors in state variables on the determination of the daytime atmospheric boundary layer depth using the bulk Richardson approach, *J. Atmos. Ocean. Tech.*, 38, 47–61, doi.org/10.1175/JTECH-D-20-0135.1, 2021.
 20. Sharma, B., Felix, J.D., Myles, L., Butler, T., Summerlin, S., and Shimizu, M.S. 2021. Wet Deposition Ethanol Concentration at US Atmospheric Integrated Research Monitoring Network (AIRMoN) Sites. *Journal of Atmospheric Chemistry*, doi:10.1007/s10874-020-09414-5.
 21. Tang, Y., Bian, H., Tao, Z., Oman, L. D., Tong, D., Lee, P., Campbell, P. C., Baker, B., Lu, C.-H., Pan, L., Wang, J., McQueen, J., and Stajner, I.: Comparison of chemical lateral boundary conditions for air quality predictions over the contiguous United States during pollutant intrusion events, *Atmos. Chem. Phys.*, 21, 2527–2550, <https://doi.org/10.5194/acp-21-2527-2021>, 2021.
 22. Yang Y., Anderson, M.C., Gao, F., Johnson, D.M., Yang, Y., Sun, L., Dulaney, W., Hain, C.R., Otkin, J.A., Prueger, J., Meyers, T.P., Bernacchi, C.J., Moore, C.E., Phenological corrections to a field-scale, ET-based crop stress indicator: An application to yield forecasting across the U.S. Corn Belt, *Remote Sensing of Environment*, Volume 257, 2021, 112337, <https://doi.org/10.1016/j.rse.2021.112337>.

Q3

23. Brune, W. H., McFarland, P. J., Bruning, E., Waugh, S., MacGorman, D., Miller, D.O., Jenkins, J. M., Ren, X., Mao, J., Peischel, J., Pollack, I., Ryerson, T.; Extreme Oxidant Amounts Produced by Lightning in Storm Clouds, *Science* 14 May 2021. <https://doi.org/10.1126/science.abg0492>
24. Cosh, MH, Caldwell, TG, Baker, CB, Bolten, JD, Edwards, N, Goble, P, Hofman, H, Ochsner, TE, Quiring, S, Schalk, C, Skumanich, M, Svoboda, M, Woloszyn, ME. Developing a strategy for the National Coordinated Soil Moisture Monitoring Network. *Vadose Zone J.* 2021; 20:e20139. <https://doi.org/10.1002/vzj2.20139>
25. Gilliam, R. C., Herwehe, J. A., Bullock, O. R., Pleim, J. E., Ran, L., Campbell, P. C., & Foroutan, H. (2021). Establishing the Suitability of the Model for Prediction Across Scales for Global Retrospective Air Quality Modeling. *Journal of Geophysical Research: Atmospheres*, 126, e2020JD033588. <https://doi.org/10.1029/2020JD033588>
26. Gonzalez, A., Millet, D., Yu, X., Wells, K., Griffis, T., Baier, B., Campbell, P. C., Choi, Y., DiGangi, J., Gvakharia, A., Halliday, H., Kort, E., McKain, K., Nowak, J., Plant, G. (2021). Fossil vs. non-fossil CO sources in the US: New airborne constraints from ACT-America and GEM. *Geophysical Research Letters*, <https://doi.org/10.1029/2021GL093361>.

27. Lee, T. R., Buban, M., and Meyers, T.P. "Application of Bulk Richardson Parameterizations of Surface Fluxes to Heterogeneous Land Surfaces," *Monthly Weather Review* 149, 10 (2021): 3243-3264, accessed Sep 24, 2021, <https://doi.org/10.1175/MWR-D-21-0047.1>
28. Lichiheb, N., Heuer, M., Hicks, B.B., Saylor, R., Vargas, R., Vázquez-Lule, A.D., St. Laurent, K., and Myles, L. (2021). Atmospheric ammonia measurements over a coastal salt marsh ecosystem along the Mid-Atlantic U.S. *Journal of Geophysical Research: Biogeosciences*, e2019JG005522, [doi:10.1029/2019JG005522](https://doi.org/10.1029/2019JG005522).
29. Loughner, C.P, B. Fasoli, A.F. Stein, and J.C. Lin (2021), Incorporating features from the Stochastic Time-Inverted Lagrangian Transport (STILT) model into the Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) model: A unified dispersion model for time-forward and time-reversed applications, *Journal of Applied Meteorology and Climatology*, 60, 799-810, [doi:10.1175/JAMC-D-20-0158.1](https://doi.org/10.1175/JAMC-D-20-0158.1).
30. Pinto, J. O., Jensen, A. A., Steiner, M., O'Sullivan, D., Taylor, S., Elston, J., Baker, C. B., Hotz, D., Marshall, C., Jacob, J., Bärffuss, K., Pigué, B., Roberts, G., Omanovic, N., Fengler, M., & Houston, A. (2021). The Status and Future of Small Uncrewed Aircraft Systems (UAS) in Operational Meteorology, *Bulletin of the American Meteorological Society* (published online ahead of print 2021), accessed Oct 6, 2021, <https://doi.org/10.1175/BAMS-D-20-0138.1>
31. Qu, Z., Jacob, D. J., Silvern, R. F., Shah, V., Campbell, P. C., Valin, L. C., & Murray, L. T. (2021). US COVID-19 shutdown demonstrates importance of background NO₂ in inferring NO_x emissions from satellite NO₂ observations. *Geophysical Research Letters*, 48, e2021GL092783. <https://doi.org/10.1029/2021GL092783>
32. Rennie, J. R., Palecki, M. A. Heuser, S. P., and Diamond, H. J., (2021). Developing and Validating Heat Exposure Products Using the U.S. Climate Reference Network. 60 (4), 543-558, doi.org/10.1175/JAMC-D-20-0282.1
33. Wu, Y., Nehrir A., X. Ren, Dickerson, R.R., Huang, J., Stratton, P.R., Gronoff, G., Kooi, S., Collins, J., Berkoff, Y.A., Let, L., Gross, B., and Moshary, F. Synergistic aircraft and ground observations of transported wildfire smoke and its impact on air quality in New York City during the summer 2018 LISTOS campaign. *Sci. Total Environ.* (2021), Article 145030, 10.1016/j.scitotenv.2021.145030

Q4

34. Benish, S. E., Salawitch, R. J., Ren, X., He, H., & Dickerson, R. R. (2021). Airborne observations of CFCs over Hebei Province, China in Spring 2016. *Journal of Geophysical Research: Atmospheres*, 126, e2021JD035152. <https://doi.org/10.1029/2021JD035152>
35. Caicedo V., Delgado, R., Luke, W.T., Ren, X., Kelley, P., Stratton, P.R., Dickerson, R.R., Berkoff, T.A., Gronoff, G., Observations of bay-breeze and ozone events over a marine site during the OWLETS-2 campaign, *Atmospheric Environment* 263, 118669 <http://doi.org/10.1016/j.atmosenv.2021.118669>
36. Campbell, P.C., Tong, D., Tang, Y., Baker, B., Lee, P., Saylor, R., Stein, A., Ma, S., Lamsal, L., Qu, Z., Impacts of the COVID-19 economic slowdown on ozone pollution in the U.S., *Atmospheric Environment*, 264, 2021, 118713, <https://doi.org/10.1016/j.atmosenv.2021.118713>.
37. Coggon, M.M., G.I. Gkatzelis, B.C. McDonald, J.B. Gilman, R.H. Schwantes, N. Abuhassan, K.C. Aikin, M.F. Arend, T.A. Berkoff, Steven.S.Brown, T.L. Campos, G. Gronoff, J.F. Hurley, G. Isaacman-VanWertz, A.R. Koss, M. Li, S.A. McKeen, F. Moshary, J. Peischl, V. Pospisilova, X. Ren, A. Wilson, Y. Wu, M. Trainer, and C. Warneke, Volatile chemical product emissions enhance ozone and modulate urban chemistry, *Proceedings of the National Academy of Sciences*, [doi:10.1073/pnas.2026653118](https://doi.org/10.1073/pnas.2026653118), 2021.
38. Desai, A. R., Khan, A. M., Zheng, T., Paleri, S., Butterworth, B., Lee, T. R., et al. (2021). Multi-sensor approach for high space and time resolution land surface temperature. *Earth and Space Science*, 8, e2021EA001842. <https://doi.org/10.1029/2021EA001842>
39. Diamond, H.J. and C. J. Schreck, Eds., 2021: The Tropics [in "State of the Climate in 2020"]. *Bull. Amer. Meteor. Soc.*, 102 (8), S199–S261, <https://doi.org/10.1175/BAMS-D-21-0080.1>.

40. Dumas, E.J., Lee, T.R., Schuyler, T.J., Buban, M., and Baker, B. NOAA Technical Memorandum OAR ARL-283: Small Unmanned Aircraft System (sUAS) Measurements at the Oliver Springs Airport. <https://doi.org/10.25923/436s-j822>
41. Ge, Y., X. Shi, Y. Ma, W. Zhang, X. Ren, J. Zheng, and Y. Zhang, Seasonality of ambient nitrous acid near a typical industry zone in the Yangtze River Delta region of China: Formation mechanisms and its contribution to the atmospheric oxidation capacity, *Atmos. Environ.*, 2021. <https://doi.org/10.1016/j.atmosenv.2021.118420>
42. Kim, H.C., S. Kim, M. Cohen, C. Bae, D. Lee, R. Saylor, M. Bae, E. Kim, B.-U. Kim, J.-H. Yoon, and A. Stein: Quantitative assessment of changes in surface particulate matter concentrations and precursor emissions over China during the COVID-19 pandemic and their implications for Chinese economic activity, *Atmospheric Chemistry and Physics*, 21, 10065–10080, 2021, [doi:10.5194/acp-21-10065-2021](https://doi.org/10.5194/acp-21-10065-2021)
43. Kochendorfer, J., Earle, M., Rasmussen, R., Smith, C., Yang, D., Morin, S., Mekis, E., Buisan, S., Roulet, Y., Landolt, S., Wolff, M., Hoover, J., Thériault, J. M., Lee, G., Baker, B., Nitu, R., Lanza, L., Colli, M., & Meyers, T. (2021). How Well are We Measuring Snow Post-SPICE?, *Bulletin of the American Meteorological Society* (published online ahead of print 2021). Retrieved Oct 5, 2021, from <https://journals.ametsoc.org/view/journals/bams/aop/BAMS-D-20-0228.1/BAMS-D-20-0228.1.xml> (Sept 16, 2021)
44. Kondragunta, S., Wei, Z., McDonald, B. C., Goldberg, D. L., & Tong, D. Q. (2021). COVID-19 induced fingerprints of a new normal urban air quality in the United States. *Journal of Geophysical Research: Atmospheres*, 126, e2021JD034797. <https://doi.org/10.1029/2021JD034797>
45. Leeper, R.D., Petersen, B., Palecki, M.A., and Diamond, H., (2021). Exploring the Use of Standardized Soil Moisture as a Drought Indicator. *Journal of Applied Meteorology and Climatology*. 60(8), 1021-1033, [10.1175/JAMC-D-20-0275.1](https://doi.org/10.1175/JAMC-D-20-0275.1)
46. MacBean, N., Scott, R.L., Biederman, J.A., Peylin, P., Kolb, T., Litvak, M.E., Krishnan, P., Meyers, T.P., Arora, V.K., Bastrikov, V., Goll, D., Lombardozzi, D.L., Nabel, J.E.M.S., Pongratz, J. Sitch, S., Walker, A.P., Zaehle, S., and Moore, D.J.P., et al Dynamic global vegetation models underestimate net CO2 flux mean and inter-annual variability in dryland ecosystems. (2021) *Environ. Res. Lett.* 16 094023 <https://doi.org/10.1088/1748-9326/ac1a38>
47. Pal, S., Clark, N.E., Lee, T.R., Conder, M., Buban, M., When and where horizontal advection is critical to alter atmospheric boundary layer dynamics over land: The need for a conceptual framework (2021) *Atmospheric Research*, 264, <https://doi.org/10.1016/j.atmosres.2021.105825>.
48. You, S., Kang, Y-K., Kim, B-U., Kim, H.C., Kim, S., The role of a distant low-pressure system in extending a high PM2.5 episode over Northeast Asia. (2021), *Atmospheric Environment*, 257, 15 July 2021, 118480 <https://doi.org/10.1016/j.atmosenv.2021.118480>

Pending Publication, may be online:

Sun, Xiaojuan, Siyan Li, Julian X. L. Wang, Panxing Wang, Guo Dong . 2021: A New Method of Significance Testing for Correlation-Coefficient Fields and Its Application. *Adv. Atmos. Sci.*, <https://doi.org/10.1007/s00376-021-1196-6> (Accepted Sept 15, 2021).

Lin, Haipeng; Jacob, D.J.; Lundgren, E.W.; Sulprizio, M.P.; Keller, C.A.; Fritz, T.M.; Eastham, S.D.; Emmons, L.K.; Campbell, P.C.; Baker, B.; Saylor, R.D.; Montuoro, R. Harmonized Emissions Component (HEMCO) 3.0 as a versatile emissions component for atmospheric models: application in the GEOS-Chem, NASA GEOS, WRF-GC, CESM2, NOAA GEFS-Aerosol, and NOAA UFS models <https://doi.org/10.5194/gmd-2021-130> (Discussion started: 3 May 2021)