



Air Resources Laboratory Publications – 2017

Journals

Barry Baker and Li Pan (2017). Overview of the Model and Observation Evaluation Toolkit (MONET) Version 1.0 for Evaluating Atmospheric Transport Models. *Atmosphere*, 8, 210; [doi:10.3390/atmos8110210](https://doi.org/10.3390/atmos8110210)

Balasubramanian, S., A. Nelson, S. Koloutsou-Vakakis, J. Lin, M.J. Rood, **L. Myles**, and C. Bernacchi. (2017) Evaluation of DeNitrification DeComposition Model for Estimating Ammonia Fluxes from Chemical Fertilizer Application. *Agricultural and Forest Meteorology*, 237, 123-134, <https://doi.org/10.1016/j.agrformet.2017.02.006>.

Biederman, J. A., R. L. Scott, T. W. Bell, D. R. Bowling, S. Dore, J. Garatuza-Payan, T. Kolb, P. Krishnan, D. J. Kroccheck, M. E. Litvak, G. E. Maurer, **T. P. Meyers**, W. C. Oechel, S. A. Papuga, G. E. Ponce-Campos, J. C. Rodriguez, W. K. Smith, R. Vargas, C. J. Watts, E. A. Yepez, and M. L. Goulden (2017). CO₂ exchange and evapotranspiration across dryland ecosystems of southwestern North America. *Global Change Biology*, 23 (10), 4204-4221. <https://doi.org/10.1111/gcb.13686>

Bieser, J., F. Slemr, J. Ambrose, C. Brenninkmeijer, S. Brooks, A. Dastoor, F. DeSimone, R. Ebinghaus, C. N. Gencarelli, B. Geyer, L. E. Gratz, I. M. Hedgecock, D. Jaffe, P. Kelley, C.-J. Lin, L. Jaegle, V. Matthias, A. Ryjkov, N. E. Selin, S. Song, O. Travnikov, A. Weigelt, **W. Luke**, X. Ren, A. Zahn, X. Yang, Y. Zhu, and N. Pirrone (2017). Multi-model study of mercury dispersion in the atmosphere: vertical and interhemispheric distribution of mercury species, *Atmospheric Chemistry and Physics*, 17, 6925-6955. <https://doi.org/10.5194/acp-17-6925-2017>.

Bray, C. D., W. Battye, V.P. Aneja, D. Tong, **P. Lee**, Y. Tang, and J.B. Nowak (2017). Evaluating ammonia (NH₃) predictions in the NOAA National Air Quality Forecast Capability (NAQFC) using in-situ aircraft and satellite measurements from the CalNex2010 campaign. *Atmospheric Environment*. 163, 65-76 <https://doi.org/10.1016/j.atmosenv.2017.05.032>

Buisán, S. T., M. E. Earle, J. L. Collado, **J. Kochendorfer**, J. Alastrué, M. Wolff, C. D. Smith, and J. I. López-Moreno (2017). Assessment of snowfall accumulation underestimation by tipping bucket gauges in the Spanish operational network, *Atmospheric Measurement Techniques*, 10, 1079-1091, [doi:10.5194/amt-10-1079-2017](https://doi.org/10.5194/amt-10-1079-2017)

Butler, A. H., J. P. Sjoberg, **D. J. Seidel**, and K. H. Rosenlof (2017). A sudden stratospheric warming compendium, *Earth System Science Data*, 9, 63-76, [doi:10.5194/essd-9-63-2017](https://doi.org/10.5194/essd-9-63-2017).

Chai, T., A. Crawford, **B. Stunder**, M. J. Pavolonis, **R. Draxler**, and **A. Stein** (2017). Improving volcanic ash predictions with the HYSPLIT dispersion model by assimilating MODIS satellite retrievals, *Atmospheric Chemistry and Physics*. 17, 2865-2879, [doi:10.5194/acp-17-2865-2017](https://doi.org/10.5194/acp-17-2865-2017)

Chai T., H.C. Kim, Li Pan, **P. Lee**, and D. Tong (2017). Impact of Moderate Resolution Imaging Spectroradiometer (MODIS) aerosol optical depth (AOD) and AirNow PM_{2.5} assimilation on Community Multi-scale Air Quality (CMAQ) aerosol predictions over the contiguous United States, *Journal of Geophysical Research Letters*, 122; 5399–5415. [doi:10.1002/2016JD026295](https://doi.org/10.1002/2016JD026295)

Dobosy, R., D. Sayres, C. Healy, E. Dumas, M. Heuer, **J. Kochendorfer**, **B. Baker**, and J. Anderson (2017). Estimating random uncertainty in airborne flux measurements over Alaskan tundra: Update on the Flux Fragment Method. *Journal of Atmospheric and Oceanic Technology*, 34, 1807-1822
<https://doi.org/10.1175/JTECH-D-16-0187.1>

Goldberg, D.L., L.N. Lamsal, C.P. Loughner, W.H. Swartz, Z.F. Lu, and D.G. Streets (2017). A high-resolution and observationally constrained OMI NO₂ satellite retrieval. *Atmospheric Chemistry and Physics*, 17, 11403-11421.
<https://doi.org/10.5194/acp-17-11403-2017>

Huang, M. G. R. Carmichael, J. H. Crawford, A. Wisthaler, X. Zhan, C. R. Hahn, **P. Lee** and A. B. Guenther, 2017, Biogenic Isoprene emissions driven by regional weather predictions using different initialization methods: case studies during the SEAC4RS and DISCOVER-AQ airborne campaigns, *Geophysical Model Development*. 10, 3085-3104. <https://www.geosci-model-dev.net/10/3085/2017/>

Kim, B.-U., C. Bae, H. Kim, E. Kim, and S. Kim (2017). Spatially and chemically resolved source apportionment analysis: Case study of high particulate matter event. *Atmospheric Environment* 162: 55-70.
<https://doi.org/10.1016/j.atmosenv.2017.05.006>

Byeong-Uk Kim, Seunghee You, Hyun Cheol Kim, Yongjae Lim, Insuk Suh, Jae-Bum Lee, Jung-Hun Woo, Soontae Kim (2017). Influence of Different Foreign Emissions Inventories on Simulated, Ground-Level Ozone in the Seoul Metropolitan Area during May 2014. *Aerosol and Air Quality Research*, 17: 3179–3193. Copyright © Taiwan Association for Aerosol Research ISSN: 1680-8584 print / 2071-1409 online [doi:10.4209/aaqr.2017.05.0165](https://doi.org/10.4209/aaqr.2017.05.0165)

Eunhye Kim, Byeong-Uk Kim, Hyun Cheol Kim and Soontae Kim (2017). The Variability

of Ozone Sensitivity to Anthropogenic Emissions with Biogenic Emissions Modeled by MEGAN and BEIS3. *Atmosphere*, 8, 187; [doi:10.3390/atmos8100187](https://doi.org/10.3390/atmos8100187)

Kim, H. C., E. Kim, C. Bae, J. H. Cho, B-U Kim, and S. Kim (2017) Regional contributions to particulate matter concentration in the Seoul metropolitan area, South Korea: seasonal variation and sensitivity to meteorology and emissions inventory, *Atmospheric Chemistry and Physics*, 17, 10315-10332, <https://doi.org/10.5194/acp-17-10315-2017>

Kim, Hyun Cheol, Soontae Kim, Byeong-Uk Kim, Chun-Sil Jin, Songyou Hong, Rokjin Park, Seok-Woo Son, Changhan Bae, MinAh Bae, Chang-Keun Song, and **Ariel Stein** (2017). Recent increase of surface particulate matter concentrations in the Seoul Metropolitan Area, Korea. *Scientific Reports* 7(1): 4710. [doi:10.1038/s41598-017-05092-8](https://doi.org/10.1038/s41598-017-05092-8)

Kochendorfer, J., R. Nitu, M. Wolff, E. Mekis, R. Rasmussen, **B. Baker**, M.E. Earle, A. Reverdin, K. Wong, C. D. Smith, D. Yang, Y.-A. Roulet, S. Buisan, T. Laine, G. Lee, J. L. C. Aceituno, J. Alastrué, K. Isaksen, **T. Meyers**, T., R. Brækkan, S. Landolt, A. Jachcik, and A. Poikonen (2017). Analysis of single-Alter-shielded and unshielded measurements of mixed and solid precipitation from WMO-SPICE, *Hydrology and Earth System Science*, 21, 3525-3542, <https://doi.org/10.5194/hess-21-3525-2017>

Kochendorfer, J., R. Rasmussen, M. Wolff, **B. Baker**, M.E. Hall, **T. Meyers**, S. Landolt, A. Jachcik, K. Isaksen, R. Brækkan, and R. Leeper (2017). The quantification and correction of wind-induced precipitation measurement errors, *Hydrology and Earth System Sciences*, 21, 1973-1989, [doi:10.5194/hess-21-1973-2017](https://doi.org/10.5194/hess-21-1973-2017)

Lamsal, L. N., Janz, S. J., Krotkov, N. A., Pickering, K. E., Spurr, R. J. D., Kowalewski, M. G., Loughner, C. P., Crawford, J. H., Swartz, W. H., Herman, J. R. (2017). High-resolution NO₂ observations from the Airborne Compact Atmospheric Mapper: Retrieval and validation. *Journal of Geophysical Research-Atmospheres*, 122(3), 1953-1970. [doi:10.1002/2016jd025483](https://doi.org/10.1002/2016jd025483)

Lee, Pius, Jeffery McQueen, Ivanka Stajner, Jianping Huang, Li Pan, Daniel Tong, Hyuncheol Kim, Youhua Tang, Shobha Kondragunta, Mark Ruminski, Sarah Lu, Eric Rogers, **Rick Saylor**, Perry Shafran, Ho-Chun Huang, Jerry Gorline, Sikchya Upadhayay, and **Richard Artz** (2017). NAQFC developmental forecast guidance for fine particulate matter (PM2.5), *Weather and Forecasting*, Volume 32, Issue 1, 343–360, <http://dx.doi.org/10.1175/WAF-D-15-0163.1>

Temple R. Lee, Michael Buban, Edward Dumas, and **C. Bruce Baker** (2017). A New Technique to Estimate Sensible Heat Fluxes around Micrometeorological Towers Using Small Unmanned Aircraft Systems, *Journal of Atmospheric and Oceanic Technology*. [doi: 10.1175/JTECH-D-17-0065.1](https://doi.org/10.1175/JTECH-D-17-0065.1)

Can Li , Chris McLinden, Vitali Fioletov, Nickolay Krotkov, Simon Carn, Joanna Joiner, David Streets, Hao He, Xinrong Ren, Zhanqing Li & Russell R. Dickerson (2017). India Is Overtaking China as the World's Largest Emitter of Anthropogenic Sulfur Dioxide. *Scientific Reports* 7, Article number: 14304. doi:10.1038/s41598-017-14639-8

Martin, C. R., N. Zeng, A. Karion, R.R. Dickerson, X. Ren, B.N. Turpie, and K.J. Weber (2017) Evaluation and environmental correction of ambient CO₂ measurements from a low-cost NDIR sensor, *Atmospheric Measurement Techniques*, 10, 2383-2395, <https://doi.org/10.5194/amt-10-2383-2017>

Nelson, A.J., S. Koloutsou-Vakakis, M.J. Rood, **L. Myles**, C. Lehmann, C. Bernacchi, S. Balasubramanian, E. Joo, M. Heuer, M. Vieira-Filho, and J. Lin. (2017) Season-long ammonia flux measurements above fertilized corn in central Illinois, USA, using relaxed eddy accumulation. *Agricultural and Forest Meteorology*, 239, 202-212, <https://doi.org/10.1016/j.agrformet.2017.03.010>.

Ngan, F and **A. F. Stein** (2017). A Long-Term WRF Meteorological Archive for Dispersion Simulations: Application to Controlled Tracer Experiments. *Journal of Applied Meteorology and Climatology*, 56, 8, 2203-2220.

<https://doi.org/10.1175/JAMC-D-16-0345.1>

Pan, S., Y. Choi, W. Jeon, A. Roy, D. A. Westenbarger, and H-C Kim (2017). Impact of high-resolution sea surface temperature, emission spikes and wind on simulated surface ozone in Houston, Texas during a high ozone episode. *Atmospheric Environment* 152: 362-376. <https://doi.org/10.1016/j.atmosenv.2016.12.030>

Daniel Pérez-Ramírez, Marcos Andrade-Flores, Thomas F. Eck, **Ariel F. Stein**, Norman T. O'Neill, Hassan Lyamani, Santiago Gassó, David N. Whiteman, Igor Veselovskii, Fernando Velarde, L. Alados-Arboledas (2017), Multi year aerosol characterization in the tropical Andes and in adjacent Amazonia using AERONET measurements. *Atmospheric Environment* 166: 412-432.

<https://doi.org/10.1016/j.atmosenv.2017.07.037>

Ren, X., ...**Mark Cohen**...et al. (2017), Methane emissions from the Marcellus Shale in southwestern Pennsylvania and northern West Virginia based on airborne measurements, *Journal of Geophysical Research-Atmospheres.*, 122, 4639–4653, doi:10.1002/2016JD026070.

Rolph, Glenn, Ariel Stein, and **Barbara Stunder** (2017). Real-time Environmental Applications and Display sYstem: READY. *Environmental Modelling & Software* 95: 210-228. <https://doi.org/10.1016/j.envsoft.2017.06.025>

Salmon, Olivia E., Paul B. Shepson, Xinrong Ren, Allison B. Marquardt Collow, Mark A. Miller, Annmarie G. Carlton, Maria O. L. Cambaliza, Alexie Heimburger, Kristan L.

Morgan, Jose D. Fuentes, Brian H. Stirm, Robert Grundman II, and Russell R. Dickerson (2017). Urban emissions of water vapor in winter. *Journal of Geophysical Research – Atmospheres* Vol. 122, Issue 17: 9467-9484.
[doi:10.1002/2016JD026074](https://doi.org/10.1002/2016JD026074)

Sayres, D. S., R. Dobosy, C. Healy, E. Dumas, **J. Kochendorfer**, J. Munster, J. Wilkerson, **B. Baker**, and J. G. Anderson (2017). Arctic regional methane fluxes by ecotope as derived using eddy covariance from a low-flying aircraft, *Atmospheric Chemistry and Physics*, 17, 8619-8633, <https://doi.org/10.5194/acp-17-8619-2017>

Sun, X. J., Wang, P. X., & Wang, J. X. L. (2017). An assessment of the atmospheric centers of action in the northern hemisphere winter. *Climate Dynamics*, 48(3-4), 1031-1047. [doi:10.1007/s00382-016-3126-3](https://doi.org/10.1007/s00382-016-3126-3)

Tang, Y., M. Pagowski, T. Chai, L. Pan, **P. Lee**, B. Baker, R. Kumar, L. Delle Monache, D. Tong, and H. Kim (2017). A Case Study of Aerosol Data Assimilation with the Community Multi-Scale Air Quality Model over the Contiguous United States using 3D-Var and Optimal Interpolation Methods, *Geosci. Model Dev.*, 10, 4743-4758. <https://doi.org/10.5194/gmd-10-4743-2017>

Tong, D. Q., **J.X. Wang**, T.E. Gill, H. Lei, and B. Wang (2017). Intensified dust storm activity and Valley fever infection in the southwestern United States. *Geophysical Research Letters*, 44(9), 4304-4312. [doi:10.1002/2017GL073524](https://doi.org/10.1002/2017GL073524)

Zhou, Chuanlong, **Mark D. Cohen**, Bernard A. Crimmins, Hao Zhou, Timothy A. Johnson, Philip K. Hopke, and Thomas M. Holsen (2017). Mercury Temporal Trends in Top Predator Fish of the Laurentian Great Lakes from 2004 to 2015: Are Concentrations Still Decreasing? *Environmental Science & Technology*. 51: 7386-7394. [doi:10.1021/acs.est.7b00982](https://doi.org/10.1021/acs.est.7b00982)

Zhou, Hao, Chuanlong Zhou, Mary M. Lynam, J. Timothy Dvonch, James A. Barres, Philip K. Hopke, **Mark Cohen**, and Thomas M. Holsen (2017). Atmospheric Mercury Temporal Trends in the Northeastern United States from 1992 to 2014: Are Measured Concentrations Responding to Decreasing Regional Emissions? *Environmental Science & Technology Letters* Volume 4 Issue 3, 91-97
[doi:10.1021/acs.estlett.6b00452](https://doi.org/10.1021/acs.estlett.6b00452)

Tech Memos and Other Reports

Dumas, E. J., T. R. Lee, M. Buban, and **B. Baker** (2017) Small Unmanned Aircraft System (sUAS) measurements during the 2017 Verifications of the Origins of Rotation in Tornadoes Experiment Southeast (VORTEX-SE). NOAA Technical Memorandum OAR ARL-274, Air Resources Laboratory, Atmospheric Turbulence

and Diffusion Division, Oak Ridge, Tennessee, 49 pp, June, 2017.
<http://dx.doi.org/10.7289/V5/TM-OAR-ARL-274>

E.J. Dumas, T.R. Lee, M. Buban, B. Baker (2017) Small Unmanned Aircraft System (sUAS) measurements during the 2017 Land-Atmosphere Feedback Experiment (LAFE). NOAA Technical Memorandum OAR ARL-277, Air Resources Laboratory, Atmospheric Turbulence and Diffusion Division, Oak Ridge, Tennessee, 61 pp, November, 2017.
ftp://ftp.library.noaa.gov/noaa_documents.lib/OAR/ARL/TM_OAR_ARL/TM_OAR_ARL_277.pdf

Dumas, Edward J. (Edward James); Wood T. S. (Thomas Shirley) (2017). Network traffic study of a DJI S-1000 Small Unmanned Aircraft System (sUAS).
<doi:10.7289/V5/TM-OAR-ARL-276>

D. Finn, K. L. Clawson, R. M. Eckman, R. G. Carter, J. D. Rich, B. R. Reese, S. A. Beard, M. Brewer, D. Davis, D. Clinger, Z. Gao, and H. Liu (2017) Project Sagebrush Phase 2. NOAA Technical Memorandum OAR ARL-275, Air Resources Laboratory, Field Research Division, Idaho Falls, ID, 417 pp, August, 2017. <https://doi.org/10.7289/V5/TM-OAR-ARL-275>