**Yunyao Li**

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Dr. Li is a research scientist at George Mason University. Dr. Li started research in 2012 working with Dr. Kenneth Pickering as a graduate research assistant at University of Maryland on deep convective transport of trace gases and WRF-Chem modeling. After got her Ph.D. in 2018, Dr. Li worked with Dr. Kayo Ide and Dr. Daryl Kleist as a postdoc at University of Maryland on stochastically perturbed physics tendencies parameter and satellite data assimilation in the GDAS/GFS system. She then continued the atmospheric modeling research with Dr. Daniel Tong on biomass burning emission and air quality modeling. Dr. Li was in charge of developing the wildfire ensemble forecasting system and GMU daily air quality forecast system. Dr. Li has over 9 years of experience in atmospheric modeling. She added several improvements on deep convective transport, lightning data assimilation, plume rise, and wildfire chemistry to WRF-Chem, CMAQ, and HYSPLIT models.

**Education**

July, 2018 Ph.D. in Atmospheric Sciences, University of Maryland, College Park, MD, USA.

June, 2012 B.S. in Atmospheric Sciences, Nanjing University of Information Science & Technology (Former Nanjing Institute of Meteorology)

**Professional Experiences**

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| 2020-Present | Research Scientist, Department of Atmospheric, Oceanic and Earth Sciences George Mason University, Fairfax, VA, U.S. |
| 2019-2020 | Postdoctoral Research Fellow, Earth System Science Interdisciplinary Center, University of Maryland, College Park, MD, U.S. |
| 2018-2019 | Postdoctoral Research Fellow, Department of Atmospheric and Oceanic Science, University of Maryland, College Park, MD, U.S. |

**Publications**

**Li, Y.,** Tong, D., Ma, S., Zhang, X., Kondragunta, S., Li, F., & Saylor, R. (2021). Dominance of wildfires impact on air quality exceedances during the 2020 record-breaking wildfire season in the United States. Geophysical Research Letters, 48, e2021GL094908. https://doi. org/10.1029/2021GL094908

Cummings, K.A., Pickering, K.E., Barth, M. C., Bela**,** M. M., **Li**, **Y.,** Allen, D.J., Bruning, E., MacGorman, D.R., Ziegler, C., Biggerstaff, M., Fuchs, B., Davis, T., Carey, L., Mecikalski, R., and Finney, D. L. (2021), Evaluation of lightning flash rate parameterizations in a cloud resolved WRF simulation of the 29-30 May 2012 Oklahoma severe supercell system observed during DC3, *J. Geophys. Res. Atmos.* (Under review)

Zhang, X., Yin, Y., van der A, R., Eskes, H., van Geffen, J., **Li, Y.,** Kuang, X., Lapierre, J. L., Chen, K., Zhen, Z., Hu, J., He, C., Chen, J., Shi, R., Zhang, J., Ye, X., and Chen, H.: Influence of convection on the upper tropospheric O3 and NOx budget in southeastern China, Atmos. Chem. Phys. Discuss. [preprint], https://doi.org/10.5194/acp-2021-650, in review, 2021.

**Li, Y.,** Tong, D. Q., Ngan, F., Cohen, M. D., Stein, A. F., Kondragunta, S., et al. (2020). Ensemble PM2.5 forecasting during the 2018 Camp Fire event using the HYSPLIT transport and dispersion model. *J. Geophys. Res. Atmos*: Atmospheres, 125, e2020JD032768. <https://doi.org/10.1029/2020JD032768>

**Li, Y.**, Pickering, K.E., Barth, M.C., Bela, M.M., Cummings, K.A., and Allen, D.J. (2019). Wet Scavenging in WRF-Chem Simulations of Parameterized Convection for a Severe Storm during the DC3 Field Campaign, *J. Geophys. Res. Atmos.* *124*, 7413–7428. https://doi.org/10.1029/2019JD030484.

**Li, Y.**, Pickering, K.E., Barth, M.C., Bela, M.M., Cummings, K.A., and Allen, D.J. (2018). Evaluation of Parameterized Convective Transport of Trace Gases in Simulation of Storms Observed During the DC3 Field Campaign. *J. Geophys. Res. Atmos*. *123*, 11,238-11,261.

Bela, M.M., Barth, M.C., Toon, O.B., Fried, A., Ziegler, C., Cummings, K.A., **Li, Y.**, Pickering, K.E., Homeyer, C.R., Morrison, H., et al. (2018). Effects of Scavenging, Entrainment, and Aqueous Chemistry on Peroxides and Formaldehyde in Deep Convective Outflow Over the Central and Southeast United States. *J. Geophys. Res. Atmos. 123*, 7594–7614.

**Li, Y.**, Pickering, K.E., Allen, D.J., Barth, M.C., Bela, M.M., Cummings, K.A., Carey, L.D., Mecikalski, R.M., Fierro, A.O., Campos, T.L., et al. (2017). Evaluation of deep convective transport in storms from different convective regimes during the DC3 field campaign using WRF-Chem with lightning data assimilation. *J. Geophys. Res. Atmos.* *122*, 2017JD026461.

Bela, M.M., Barth, M.C., Toon, O.B., Fried, A., Homeyer, C.R., Morrison, H., Cummings, K.A., **Li, Y.**, Pickering, K.E., Allen, D.J., et al. (2016). Wet scavenging of soluble gases in DC3 deep convective storms using WRF-Chem simulations and aircraft observations. *J. Geophys. Res. Atmos.* *121*, 2015JD024623.

Fried, A., Barth, M. c., Bela, M., Weibring, P., Richter, D., Walega, J., **Li, Y.**, Pickering, K., Apel, E., Hornbrook, R., et al. (2016). Convective transport of formaldehyde to the upper troposphere and lower stratosphere and associated scavenging in thunderstorms over the central United States during the 2012 DC3 study. *J. Geophys. Res. Atmos*. *121*, 2015JD024477.

Cummings, K., Pickering, K., Barth, M., Bela, M., **Li, Y.**, Allen, D., Bruning, E., MacGorman, and et al. (2014). A WRF-Chem flash rate parameterization scheme and LNOx analysis of the 29-30 May 2012 convective event in Oklahoma during DC3, XV International Conference on Atmospheric Electricity, June 2014, Norman, Oklahoma, U.S.A.

**SELECTED CONFERENCE PRESENTATIONS**

**Li, Y.,** Tong, D., Ma, S., Zhang, X., Kondragunta, S., Li, F., & Saylor, R., Kahn, R. (2021), Impact of Different Plume Rise Schemes on Wildfire Pollution Dispersion & PM2.5 Exceedance Prediction during 2020 & 2021 Wildfire Seasons, American Geophysical Union Annual Meeting, December. (Oral)

**Li, Y**., Tong, D., Ngan, F., Cohen, M.D., Kondragunta, S., Zhang, X., Ichuko, C., Hyer, E.J., Kahn, R.A. (2020), Ensemble PM2.5 Forecasting during the 2018 Camp Fire event using the HYSPLIT model & using TROPOMI to improve the forecast, American Geophysical Union Annual Meeting, December. (Oral)

**Li, Y.,** Tong, D., Murphy, B., Alcarado, M., Tang, Y., Lee, P., Ma, S. (2020), Adding two wildfire related improvements into CMAQ Model. Community Modeling and Analysis System Annual Meeting, October, Chapel Hill, NC. (Oral)

**Li, Y**., Tong, D., Ngan, F., Cohen, M.D., Stein, A.F., Kondragunta, S., Zhang, X., Ichuko, C., Hyer, E.J., Kahn, R.A. (2019), Ensemble Forecast of PM2.5 during the 2018 Camp Fire Event Using the HYSPLIT Transport and Dispersion Model, 2019 Cooperative Institute for Satellite Earth System Studies (CISESS) Science Meeting, November, College Park, MD. (Oral)

**Li, Y.**, Pickering, K. E., Barth, M. C., Bela, M. M., Cummings, K. A., and Allen, D. J. (2019), Improvement of parameterized convective transport and wet scavenging of trace gases in the WRF-Chem model, Meteorology and Climate - Modeling for Air Quality Conference, September, Davis, CA. (Oral)

**Li, Y.**, Pickering, K. E., Barth, M. C., Bela, M. M., Cummings, K. A., Allen, D. J., and Fierro, A. O. (2018), Wet Scavenging in Cumulus-Parameterized WRF-Chem Simulations of a Supercell Storm during the DC3 Field Campaign, American Geophysical Union Annual Meeting, December, Washington, D.C. (Poster)

**Li, Y.** (2018), Deep Convective Transport and Wet Scavenging of Trace gases. George Washington University-Johns Hopkins University-University of Maryland Students/Postdoc Fluid Symposium, May, Washington, D.C. (Invited talk)

**Li, Y.**, Pickering, K. E., Barth, M. C., Bela, M. M., Cummings, K. A., Allen, D. J., and Fierro, A. O (2017), Deep convective transport in cumulus-parameterized and cloud-resolved WRF-Chem simulations of an MCS and storms from different convective regimes during the DC3 Field campaign, American Geophysical Union Annual Meeting, December, New Orleans, LA. (Poster)

**Li, Y.**, Pickering, K. E., Barth, M. C., Bela, M. M., Cummings, K. A., Allen, D. J., Carey, L. D., Mecikalski, R. M., and Fierro, A. O. (2016), Comparison of deep convective transport in cumulus-parameterized and cloud-resolved WRF-Chem simulations of different scale storms during the DC3 field campaign, American Geophysical Union Annual Meeting, December, San Francisco, CA. (Oral)

**Li, Y.**, Pickering, K. E., Barth, M. C., Bela, M. M., Cummings, K. A., Allen, D. J., Carey, L. D., Mecikalski, R. M., and Fierro, A. O. (2016), WRF-Chem simulation of deep convective transport in different scale storms using lightning data assimilation, 17th WRF Users' Workshop, June, Boulder, CO. (Oral)

**Li, Y.**, Pickering, K. E., Barth, M. C., Bela, M. M., Cummings, K. A., Allen, D. J., Carey, L. D., Mecikalski, R. M., Fierro, A. O., Mullendore, G. (2016), Deep Convective Transport In Convective Systems Of Three Different Scales From The DC3 Field Campaign Using Results From WRF-Chem Simulations With Lightning Data Assimilation, 96th American Meterological Society Annual Meeting, January, New Orleans, LA. (Oral)

**Li, Y.**, Pickering, K. E., Barth, M. C., Bela, M. M., Cummings, K. A., Allen, D. J., Carey, Diskin, G. S., Campos, T. L., and Fierro, A. O., (2014). An Analysis of Deep Convective Transport in the May 21, 2012 DC3 Alabama Thunderstorms using Results from WRF-Chem Simulations. AGU annual meeting, December, San Francisco, CA. (Poster)