Xin Lan, Ph.D.

Research Scientist II
Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado Boulder
NOAA, Global Monitoring Laboratory
325 Broadway R/GMD1, Boulder, CO, 80305

Email: xin.lan@noaa.gov
Phone: 347-276-3889

Education

University of Houston	Ph.D in Atmospheric Science	2011-2014
University of New Hampshire	Ph.D Study in Earth and Environmental Science	2010
Sun Yet-sen University	B.S. in Applied Meteorology	2006-2010

Employment

Research Scientist – CIRES, University of Colorado/Global Monitoring Laboratory, National Oceanic and Atmospheric Administration (NOAA)	2016-present
National Research Council Post-Doctoral Fellow – Global Monitoring Laboratory, NOAA	2015-2016
Post-Doctoral Researcher – University of Houston	2015
Research Assistant – University of Houston	2011-2014
Research Assistant – University of New Hampshire	2010
Research Assistant – Sun Yat-sen University	2007-2010

Selected Publications

- **Lan, X**., Nisbet, E.G., Dlugokencky, E.J. and Michel, S.E., 2021. What do we know about the global methane budget? Results from four decades of atmospheric CH4 observations and the way forward. *Philosophical Transactions of the Royal Society A*, *379*(2210), p.20200440.
- Palmer, P.I., Feng, L., Lunt, M.F., Parker, R.J., Bösch, H., **Lan, X**., Lorente, A. and Borsdorff, T., 2021. The added value of satellite observations of methane forunderstanding the contemporary methane budget. *Philosophical Transactions of the Royal Society A*, *379*(2210), p.20210106.
- Chang, K.L., Schultz, M.G., **Lan, X**., McClure-Begley, A., Petropavlovskikh, I., Xu, X. and Ziemke, J.R., 2021. Trend detection of atmospheric time series: Incorporating appropriate uncertainty estimates and handling extreme events. *Elem Sci Anth*, *9*(1), p.00035.
- **Lan, X**., Basu, S., Schwietzke, S., Bruhwiler, L., Dlugokencky, E.J., Michel, S.E., Sherwood, O., Tans, P. P., Thoning, K., Etiope, G., Zhuang, Q., Liu, L., Oh, Y., Miller, J., Petron, G., Vaughn, B. H., Andrews, A., Crippa, M., 2021. Improved constraints on global methane emissions and sinks using $\delta^{13}CH_4$. *Global Biogeochemical Cycles*, 35 (6), e2021GB007000.
- Wang, F., Maksyutov, S., Janardanan, R., Tsuruta, A., Ito, A., Morino, I., Yoshida, Y., Tohjima, Y., Kaiser, J.W., Janssens-Maenhout, G. and **Lan, X**., 2021. Interannual variability on methane emissions in monsoon Asia derived from GOSAT and surface observations. *Environmental Research Letters*, *16*(2), p.024040.
- **Lan, X**., Tans, P., Sweeney, C., Andrews, A., Dlugokencky, E., Schwietzke, S., Kofler, J., McKain, K., Thoning, K., Crotwell, M. and Montzka, S., 2019. Long-term measurements show little

evidence for large increases in total US methane emissions over the past decade. *Geophysical Research Letters*, *46*(9), pp.4991-4999.

- Ganesan, A.L., Schwietzke, S., Poulter, B., Arnold, T., **Lan, X**., Rigby, M., Vogel, F.R., van der Werf, G.R., Janssens-Maenhout, G., Boesch, H. and Pandey, S., 2019. Advancing scientific understanding of the global methane budget in support of the Paris Agreement. *Global Biogeochemical Cycles*, *33*(12), pp.1475-1512.
- Yang, S., **Lan, X**., Talbot, R. and Liu, L., 2019. Characterizing anthropogenic methane sources in the Houston and Barnett Shale areas of Texas using the isotopic signature δ13C in CH4. *Science of The Total Environment*, *696*, p.133856.
- **Lan, X**., Tans, P., Sweeney, C., Andrews, A., Jacobson, A., Crotwell, M., Dlugokencky, E., Kofler, J., Lang, P., Thoning, K. and Wolter, S., 2017. Gradients of column CO 2 across North America from the NOAA global greenhouse gas reference network. *Atmospheric Chemistry and Physics*, *17*(24), pp.15151-15165.
- **Lan, X.**, Talbot, R., Laine, P. and Torres, A., 2015. Characterizing fugitive methane emissions in the Barnett Shale area using a mobile laboratory. *Environmental science & technology*, *49*(13), pp.8139-8146.
- Zavala-Araiza, D., Lyon, D.R., Alvarez, R.A., Davis, K.J., Harriss, R., Herndon, S.C., Karion, A., Kort, E.A., Lamb, B.K., **Lan, X.** and Marchese, A.J., 2015. Reconciling divergent estimates of oil and gas methane emissions. *Proceedings of the National Academy of Sciences*, *112*(51), pp.15597-15602.
- Lyon, D.R., Zavala-Araiza, D., Alvarez, R.A., Harriss, R., Palacios, V., **Lan, X.**, Talbot, R., Lavoie, T., Shepson, P., Yacovitch, T.I. and Herndon, S.C., 2015. Constructing a spatially resolved methane emission inventory for the Barnett Shale region. *Environmental science & technology*, *49*(13), pp.8147-8157.
- Zavala-Araiza, D., Lyon, D., Alvarez, R.A., Palacios, V., Harriss, R., **Lan, X.**, Talbot, R. and Hamburg, S.P., 2015. Toward a functional definition of methane super-emitters: Application to natural gas production sites. *Environmental science & technology*, *49*(13), pp.8167-8174.
- Nathan B., Zondlo M., Ross K., O'Brien A., Harrison W., Lary D., and **Lan X.**: Near-Field Characterization of Methane Emissions from a Compressor Station Using a Model Aircraft, in preparation for submission to Environ. Sci. Tech, 2015.
- Liu, L., Talbot, R. and **Lan, X.**, 2015. Influence of climate change and meteorological factors on Houston's air pollution: Ozone a case study. *Atmosphere*, *6*(5), pp.623-640.
- Lavoie, T., Shepson, P., Cambaliza1, M., Karion, A., Sweeney, C., Kort, C., Hirst, B., Yacovitch, T., **Lan, X.**, Lyon, D., Alvarez, R., Harriss, R.: Measurements of Point Source Methane Emissions in the Barnett Shale Basin, submitted to Environ. Sci. Tech., 2015.
- **Lan, X.**, Talbot, R., Laine, P., Lefer, B., Flynn, J., and Torres, A.: Seasonal and Diurnal Variations of Total Gaseous Mercury in Urban Houston, Texas (U.S.A.), *Atmos*., *5*, 399-419, doi:10.3390/atmos5020399, 2014.
- **Lan, X.**, Talbot, R., Laine, P., Lefer, B., and Flynn, J., Atmospheric Mercury Measurements in the Barnett Shale Area, Texas: Implications for Emissions from Oil and Gas Processing, submitted to Environ. Sci. Tech, 2014.
- **Lan, X.**, Talbot, R., Castro, M., Perry, K., and Luke, W.: Seasonal and Diurnal Variations of Atmospheric Mercury across the US Determined from Amnet Monitoring Data, *Atmos. Chem. Phys*., *12*, 10569-10582, doi:10.5194/acp-12-10569-2012, 2012.