

Biographical Sketch: John Chun-Han Lin

Prof. John C. Lin is currently a Professor in the Department of Atmospheric Sciences at the University of Utah.

Lin's research is inter-disciplinary in nature, reflecting his diverse educational background. He studied plant physiology at Harvard University (advisor: N.M. Holbrook) for his B.A. and M.A. degrees in Biology. He then transferred to a Ph.D. program at Harvard's Dept. of Earth and Planetary Sciences (advisor: S.C. Wofsy), in which he carried out research on greenhouse gases, interpreting aircraft data with atmospheric and biospheric models (see below). He won a NOAA Postdoctoral Fellowship and held the award at Colorado State University, where he was trained in satellite data analyses and mesoscale meteorological modeling (advisor: R.A. Pielke, Sr.).

Lin has expertise in modeling of greenhouse gases, pollutants, and inverse analyses for over ten years. He was among the first to integrate continental atmospheric CO₂ concentrations with land surface observations to estimate regional scale carbon sources/sinks [Gerbig *et al.*, 2003; Lin *et al.*, 2004]. Over the years he has been invited to participate in multi-institutional, international efforts at studying the Carbon Cycle. He was a contributing author to the North American Carbon Program (NACP).

He has extensive experience in Lagrangian modeling of the atmosphere and is the original author of the STILT atmospheric model [Lin *et al.*, 2003]. STILT is being used by a growing community (over 20 institutions internationally) for interpreting trace gas measurements made at ground based stations, on aircraft, as well as for remote sensing. He served as the Convener for AGU's prestigious Chapman Conference on "Advances in Lagrangian Modeling of the Atmosphere" and is the Chief Editor of an AGU Geophysical Monograph on Lagrangian Modeling [Lin *et al.*, 2012].

Lin is the Principal Investigator of several projects focused on pollutant emissions in northern Utah. He is serving on the Science Teams of NASA's OCO-2 mission and the Carbon Monitoring System. Lin is a member of North American Carbon Program's Science Leadership Group and until recently served as Editorial Board Member for *Nature Scientific Reports*.

EMPLOYMENT

Professor, Dept. of Atmospheric Sciences, Univ. of Utah, 2018~present.

Associate Professor, Dept. of Atmospheric Sciences, Univ. of Utah, 2012~2018.

Associate Professor, Dept. of Earth & Environmental Sciences, Univ. of Waterloo, 2011~12.

Assistant Professor, Dept. of Earth & Environmental Sciences, Univ. of Waterloo, 2006~11.

NOAA Postdoctoral Fellow in Climate and Global Change, Colorado State Univ., 2005~06.

EDUCATION

Harvard University	Ph.D. (Earth & Planetary Sciences)	2003	Cambridge, MA, USA
Harvard University	M.A. (Biology)	1997	Cambridge, MA, USA
Harvard College	B.A. (Biology)	1997	Cambridge, MA, USA

AWARDS

- University of Utah Top Researcher Award, 2017.
- Ontario Early Researcher Award, 2008.
- NOAA Postdoctoral Fellowship in Climate and Global Change, 2004.
- Harvard University Distinction in Teaching Award, 2002.
- NASA Earth System Science Fellowship, 1998-2001.

SELECTED PUBLICATIONS

Mitchell, L.E., J.C. Lin, et al., Long-term urban carbon dioxide observations reveal spatial and temporal dynamics related to urban form and growth, *Proceedings of the National Academy of*

- Sciences*, www.pnas.org/cgi/doi/10.1073/pnas.1702393115, 2018.
- Bares, R., **J. Lin**, S. Hoch, M. Baasandorj, D. Mendoza, B. Fasoli, L. Mitchell, and B. Stephens, The wintertime co-variation of CO₂ and criteria pollutants in an urban valley of the Western U.S., *Journal of Geophysical Research-Atmospheres*, doi://10.1002/2017JD027917, 2018.
- Fasoli, B., **J.C. Lin**, D.R. Bowling, L. Mitchell, and D. Mendoza: Simulating atmospheric tracer concentrations for spatially distributed receptors: updates to the Stochastic Time-Inverted Lagrangian Transport model's R interface (STILT-R version 2), *Geoscientific Model Development Discussions*, <https://doi.org/10.5194/gmd-2018-20>, 2018.
- Lin, J.C.**, D. Mallia, D. Wu, and B.B. Stephens, How can mountaintop CO₂ observations be used to constrain regional carbon fluxes?, *Atmospheric Chemistry and Physics*, 17, 5561-5581, doi:10.5194/acp-17-5561-2017, 2017.
- Baasandorj, M., S. Hoch, R. Bares, **J. Lin**, et al., Contribution of early morning and nighttime chemistry to wintertime PM_{2.5} pollution episodes in Salt Lake Valley, Utah, *Environmental Sciences and Technology*, 51 (11), pp 5941–5950.
- Patarasuk, R., K.R. Gurney, D. O'Keefe, Y. Song, J. Huang, P. Rao, M. Buchert, **J.C. Lin**, et al., Application of high-resolution fossil fuel CO₂ emissions quantification to urban climate policy, *Urban Ecosystems*, DOI 10.1007/s11252-016-0553-1, 2016.
- Raczka, B., H. Duarte, C.D. Koven, D. Ricciuto, P.E. Thornton, **J.C. Lin**, and D. R. Bowling, An observational constraint on stomatal function in forests: evaluating coupled carbon and water vapor exchange with carbon isotopes in the Community Land Model (CLM 4.5), *Biogeosciences*, 13, 5183-5204, doi:10.5194/bg-13-5183-2016, 2016.
- Luus, K.A. and **J.C. Lin**, The Polar Vegetation Photosynthesis and Respiration Model (PolarVPRM): A parsimonious, satellite-data-driven model of high-latitude CO₂ exchange, *Geoscientific Model Development*, 8, 2655-2674, 2015.
- Lin, J.C.** and D. Wen, A method to quantitatively apportion pollutants at high spatial and temporal resolution: the Stochastic Lagrangian Apportionment Method (SLAM), *Environmental Science and Technology*, 49, 351-360, doi: 10.1021/es505603v, 2015.
- Mallia, D.V., **J.C. Lin**, S. Urbanski, J. Ehleringer, and T. Nehrkorn, Impacts of upstream wildfire emissions on CO, CO₂, and PM_{2.5} concentrations in Salt Lake City, Utah, *J. Geophys. Res.-Atmos.*, 120, doi:10.1002/2014JD022472, 2015.
- Wen, D., L. Zhang, **J.C. Lin**, R. Vet, and M.D. Moran, An evaluation of ambient ammonia concentrations over southern Ontario simulated with different dry deposition schemes within STILT-Chem v0.8, *Geoscientific Model Development*, 7, 1037-1050, doi:10.5194/gmd-7-1037-2014, 2014.
- Lin, J.C.**, D. Brunner, C. Gerbig, A. Stohl, A. Luhar, and P. Webley (Editors), *Lagrangian Modeling of the Atmosphere*, AGU Geophysical Monograph (Vol. 200), Washington D.C., American Geophysical Union, 349 pages, 2012.
- Wen, D., **J.C. Lin**, D. Millet, et al., A backward-time stochastic Lagrangian air quality model, *Atmospheric Environment*, 54, 373-386, doi:10.1016/j.atmosenv.2012.02.042, 2012.
- Lin, J.C.**, D. Brunner, and C. Gerbig. *Studying atmospheric transport through Lagrangian models*, EOS, 92 (21), 177-184, 24 May 2011.
- Lin, J.C.**, T. Matsui, R.A. Pielke, Sr., C. Kummerow. *Effects of biomass burning-derived aerosols on precipitation and clouds in the Amazon Basin: A satellite-based empirical study*, J. Geophys. Res., 111 (D19204), doi:10.1029/2005JD006884, 2006.
- Lin, J.C.**, C. Gerbig, S.C. Wofsy, et al., A near-field tool for simulating the upstream influence of atmospheric observations: The Stochastic Time-Inverted Lagrangian Transport (STILT) model, *J. Geophys. Res.*, 108(D16), 4493, doi:10.1029/2002JD003161, 2003.
- Gerbig, C., **J.C. Lin**, S.C. Wofsy, et al., Toward constraining regional-scale fluxes of CO₂ with atmospheric observations over a continent: 2. Analysis of COBRA data using a receptor-oriented framework, *J. Geophys. Res.*, 108(D24), 4757, doi:10.1029/2003JD003770, 2003b.