

ALEXANDER J. TURNER

B47 Hildebrand Hall, University of California, Berkeley, CA 94720
(303) 810-3162 • alexjturner@berkeley.edu • <https://alexjturner.github.io/index.html>

EDUCATION

Ph.D., Harvard University Atmospheric Chemistry, Advisor: Daniel J. Jacob	2012 – 2017
B.S., University of Colorado at Boulder Mechanical Engineering, Advisor: Daven K. Henze	2008 – 2012

PROFESSIONAL EXPERIENCE

Miller Postdoctoral Fellow , University of California at Berkeley	2017 –
Graduate Research Assistant , Harvard University	2012 – 2017
Visiting Scholar , University of California at Berkeley	2014 & 2016
Undergraduate Research Assistant , University of Colorado at Boulder	2010 – 2012
Undergraduate Research Assistant , NOAA Geophysical Fluid Dynamics Lab	2011
Undergraduate Research Assistant , DOE Lawrence Berkeley National Lab	2010

AWARDS AND FELLOWSHIPS

Miller Fellowship at UC Berkeley	(Postdoctoral Fellowship, <i>11 Recipients</i>)	2017 – 2020
Department of Energy CSGF Fellowship	(National Fellowship, <i>10 Recipients</i>)	2013 – 2017
Department of Defense NDSEG Fellowship, <i>declined</i>	(National Fellowship, <i>200 Recipients</i>)	2013
CU Boulder “Outstanding Graduate for Research”	(College Award, <i>Sole Recipient</i>)	2012
Vestas Mechanical Engineering Student of the Year	(National Award, <i>Sole Recipient</i>)	2010
NOAA Ernest F. Hollings Scholar	(National Scholarship, <i>100 Recipients</i>)	2010 – 2012

PEER-REVIEWED PUBLICATIONS (*SUBMITTED)

h-index = 9, total citations = 289 (*as of 12 Feb. 2018 on Google scholar*)

- *20. **Turner, A. J.**, D. J. Jacob, J. Benmergui, J. Brandman, L. White, and C. A. Randles (submitted), Assessing the capability of different satellite observing configurations to resolve the distribution of methane emissions at kilometer scales, *submitted*.
- *19. Sheng, J. X., D. J. Jacob, **A. J. Turner**, J. D. Maasakkers, M. P. Sulprizio, A. A. Bloom, A. E. Andrews, and D. Wunch (submitted), High-resolution inversion of methane emissions in the Southeast US using SEAC⁴RS aircraft observations of atmospheric methane: anthropogenic and wetlands sources, *submitted*.
- *18. Sheng, J. X., D. J. Jacob, **A. J. Turner**, J. D. Maasakkers, J. Benmergui, A. A. Bloom, C. Arndt, R. Gautam, D. Zavala-Araiza, S. P. Hamburg, H. Boesch, and R. J. Parker (submitted), 2010–2015 methane trends over Canada, the United States, and Mexico observed by the GOSAT satellite: contributions from different source sectors, *submitted*.
- 17. Bloom, A. A., K. Bowman, M. Lee, **A. J. Turner**, R. Schroeder, J. R. Worden, R. J. Weidner, K. McDonald, and D. J. Jacob (2017), A global wetland methane emissions and uncertainty dataset for atmospheric chemical transport models (WetCHARTs version 1.0), *Geosci. Mod. Dev.*, *10*, 2141–2156, doi:10.5194/gmd-10-2141-2017.
- 16. Buchwitz, M., O. Schneising, M. Reuter, J. Heymann, S. Krautwurst, H. Bovensmann, J. P. Burrows, H. Boesch, R. J. Parker, P. Somkuti, R. G. Detmers, O. P. Hasekamp, I. Aben, A. Butz, C. Frankenberg, and **A. J. Turner** (2017), Satellite-derived methane hotspot emission estimates using a fast data-driven method, *Atmos. Chem. Phys.*, *17*, 5751–5744, doi:10.5194/acp-17-5751-2017.
- 15. **Turner, A. J.**, C. Frankenberg, P. O. Wennberg, and D. J. Jacob (2017), Ambiguity in the causes for decadal trends in atmospheric methane and hydroxyl, *Proc. Natl. Acad. Sci.*, *114*, 5367–5372, doi:10.1073/pnas.1616020114.
- 14. Tzompa-Sosa, Z. A., E. V. Fischer, E. Mahieu, B. Franco, C. A. Keller, **A. J. Turner**, D. Helmig, A. Fried, D. Richter, P. Weibring, J. Walega, T. I. Yacovitch, S. C. Herndon, D. R. Blake, F. Hase, J. Hannigan, S. Conway, K. Strong, and M. Schneider (2017), Revisiting global fossil fuel and biofuel emissions of ethane, *J. Geophys. Res.*, *122*, 2493–2512, doi:10.1002/2016JD025767.
- 13. Bader, W., B. Bovy, S. Conway, K. Strong, D. Smale, **A. J. Turner**, T. Blumenstock, C. Boone, M. C. Coen, A. Coulon, O. Garcia, D. W. T. Griffith, F. Hase, P. Hausmann, N. Jones, P. Krummel, I. Murata, I. Morino, H. Nakajima, S. O’Doherty, C. Paton-Walsh, J. Robinson, R. Sandrin, M. Schneider, C. Servais, R. Sussmann, and E. Mahieu (2017), The recent increase of atmospheric methane from 10 years of ground-based NDACC FTIR observations since 2005, *Atmos. Chem. Phys.*, *17*, 2255–2277, doi:10.5194/acp-17-2255-2017.

12. Maasakkers, J. D., D. J. Jacob, M. Sulprizio, **A. J. Turner**, M. Weitz, T. Wirth, C. Hight, M. DeFigueiredo, M. Desai, R. Schmeltz, L. Hockstad, A. A. Bloom, K. W. Bowman, S. Jeong, and M. L. Fischer (2016), A gridded national inventory of US methane emissions, *Env. Sci. Technol.*, *50*, 13123–13133, doi:10.1021/acs.est.6b02878.
11. Jacob, D. J., **A. J. Turner**, J. D. Maasakkers, J. Sheng, K. Sun, X. Liu, K. Chance, I. Aben, J. McKeever, and C. Frankenberg (2016), Satellite observations of atmospheric methane and their application to constrain emissions, *Atmos. Chem. Phys.*, *16*, 14371–14396, doi:10.5194/acp-16-14371-2016.
10. **Turner, A. J.**, A. A. Shusterman, B. C. McDonald, V. Teige, R. A. Harley, and R. C. Cohen (2016), Network design for quantifying urban CO₂ emissions: assessing trade-offs between precision and network density, *Atmos. Chem. Phys.*, *16*, 13465–13475, doi:10.5194/acp-16-13465-2016.
9. Shusterman, A. A., V. Teige, **A. J. Turner**, C. Newman, J. Kim, and R. C. Cohen (2016), The BErkeley Atmospheric CO₂ Observation Network: Initial Evaluation, *Atmos. Chem. Phys.*, *16*, 13449–13463, doi:10.5194/acp-16-13449-2016.
8. Tan, Z., Q. Zhuang, D. K. Henze, C. Frankenberg, E. Dlugokencky, C. Sweeney, **A. J. Turner**, M. Sasakawa, and T. Machida (2016), Inverse modeling of pan-Arctic methane emissions at high spatial resolution: What can we learn from assimilating satellite retrievals and using different process-based wetland and lake biogeochemical models?, *Atmos. Chem. Phys.*, *16*, 12649–12666, doi:10.5194/acp-16-12649-2016.
7. Bousserrez, N., D. K. Henze, B. Rooney, A. Perkins, K. J. Wecht, **A. J. Turner**, V. Natraj, and J. R. Worden (2016), Constraints on methane emissions in North America from future geostationary remote sensing measurements, *Atmos. Chem. Phys.*, *16*, 6175–6190, doi:10.5194/acp-16-6175-2016.
6. **Turner, A. J.**, D. J. Jacob, J. Benmergui, S. C. Wofsy, J. D. Maasakkers, A. Butz, O. Hasekamp, and S. C. Biraud (2016), A large increase in U.S. methane emissions over the past decade inferred from satellite data and surface observations, *Geophys. Res. Lett.*, *43*, doi:10.1002/2016GL067987.
5. Worden, J. R., **A. J. Turner**, A. Bloom, S. S. Kulawik, J. Liu, M. Lee, R. Weidner, K. Bowman, C. Frankenberg, R. J. Parker, and V. H. Payne (2015), Quantifying Lower Tropospheric Methane Concentrations Using Near-IR and Thermal IR Satellite Measurements: Comparison to the GEOS-Chem model, *Atmos. Meas. Tech.*, *8*, 3433–3445, doi:10.5194/amt-8-3433-2015.
4. **Turner, A. J.**, D. J. Jacob, K. J. Wecht, J. D. Maasakkers, E. Lundgren, A. E. Andrews, S. C. Biraud, H. Boesch, K. W. Bowman, N. M. Deutscher, M. K. Dubey, D. W. T. Griffith, F. Hase, A. Kuze, J. Notholt, H. Ohyama, R. Parker, V. H. Payne, R. Sussmann, C. Sweeney, V. A. Velazco, T. Warneke, P. O. Wennberg, and D. Wunch (2015), Estimating global and North American methane emissions with high spatial resolution using GOSAT satellite data, *Atmos. Chem. Phys.*, *15*, 7049–7069, doi:10.5194/acp-15-7049-2015.
3. **Turner, A. J.** and D. J. Jacob (2015), Balancing aggregation and smoothing errors in inverse models, *Atmos. Chem. Phys.*, *15*, 7039–7048, doi:10.5194/acp-15-7039-2015.
2. **Turner, A. J.**, A. M. Fiore, L. W. Horowitz, and M. Bauer (2013), Summertime cyclone frequencies over the Great Lakes Storm Track from 1860–2100: variability, trends, and association with ozone pollution, *Atmos. Chem. Phys.*, *13*, 565–578, doi:10.5194/acp-13-565-2013.
1. **Turner, A. J.**, D. K. Henze, R. V. Martin, and A. Hakami (2012), The spatial extent of source influences on modeled column concentrations of short-lived species, *Geophys. Res. Lett.*, *39*, L12806, doi:10.1029/2012GL051832.

SELECTED ORAL CONFERENCE PRESENTATIONS ([†]INVITED)

- 2017 AGU Fall Meeting, New Orleans, LA
- 2017[†] UN Climate Change Conference (COP23), Bonn, Germany
- 2017 ACCESS XIV Meeting, Brookhaven National Laboratory
- 2017[†] DOE Computational Science Graduate Fellowship Program Review, Washington, DC
- 2016 AGU Fall meeting, San Francisco, CA
- 2015 11th International Workshop on Greenhouse Gas Measurements from Space, Caltech
- 2015 7th International GEOS-Chem Meeting, Harvard University
- 2015 5th North American Carbon Program Meeting, Washington, DC
- 2014 AGU Fall Meeting, San Francisco, CA
- 2013 AGU Fall Meeting, San Francisco, CA
- 2011 AGU Fall Meeting, San Francisco, CA
- 2011 5th International GEOS-Chem Meeting, Harvard University

INVITED SEMINARS

- 2017 Japanese Aerospace Exploration Agency (JAXA)
- 2017 California Institute of Technology (Caltech)
- 2016 Massachusetts Institute of Technology (MIT)
- 2016 NASA Jet Propulsion Laboratory (JPL)
- 2016 NOAA Earth System Research Laboratory (ESRL)
- 2016 IBM Thomas J. Watson Research Center
- 2014 DOE Lawrence Livermore National Laboratory (LLNL)
- 2014 NOAA Earth System Research Laboratory (ESRL)

TEACHING EXPERIENCE

- 2014 **Atmospheric Chemistry** (21 students), Harvard University
- 2011 **Numerical Methods** (100+ students), University of Colorado – *Outstanding Teaching Assistant Award*
- 2010 **Numerical Methods** (100+ students), University of Colorado
- 2010 **First-Year Engineering Projects** (25 students), University of Colorado

SERVICE ACTIVITIES

- Proposal reviewer for *NASA*.
- Peer reviewer for *Nature Geosci.*, *Geophys. Res. Lett.*, *J. Geophys. Res.*, *Atmos. Chem. Phys.*, *Atmos. Meas. Tech.*, *Geosci. Model Dev.*, and *Atmos. Environ.*
- Japanese National Institute for Environmental Studies, workshop participant (2017, 2018) and report co-author: “*A guidebook on the use of satellite greenhouse gases observation data for verification of greenhouse gases emission inventories*”
- Harvard University Earth & Planetary Science faculty search: student advisory committee (2017)

TECHNICAL SKILLS

- Graduate Coursework: Inverse Methods, Partial Differential Equations, Stochastic Optimization, Parallel Computing, Environmental Modeling, Atmospheric Chemistry, Aerosols, Spectroscopy, Physics of Climate, Computing Foundations, Classical Thermo., Stat. Thermo., and Fluid Dynamics.
- Programming: Matlab, Python, Julia, R, IDL, Fortran 77/90, Shell Scripting, Keras, Mathematica, html.
- Computing Tools: MPI, CUDA, OpenMP, MapReduce, Unix, Amazon EC2, L^AT_EX.

RESEARCH GRANTS AND COMPUTING ALLOCATIONS

Development of an efficient method to compute footprints for dense observing systems

150,000 CPU hours & 20,000 Storage Units, Alexander J. Turner (PI)

- NERSC ERCAP Grant 60675
- Jan 9, 2018 – Jan 7, 2019

On the utility of satellite observations for constraining fine-scale methane fluxes and super-emitters

400,000 CPU hours, Alexander J. Turner (PI)

- NCAR/CISL Allocation Number: UHAR0006
- May 19, 2017 – May 18, 2018

Estimating urban carbon dioxide fluxes at high resolution from in situ observations

650,000 CPU hours & 400,000 Storage Units, Alexander J. Turner (PI)

- NERSC ERCAP Grant 87628
- Jan 12, 2014 – Jan 9, 2017