

# ALEXANDER J. TURNER

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## EDUCATION

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

## PROFESSIONAL EXPERIENCE

<b>Calvin Professor of Atmospheric Science</b> , University of Washington	2022 – 2024
<b>Assistant Professor</b> , University of Washington	2021 –
<b>Research Affiliate</b> , NASA Jet Propulsion Lab	2018 – 2021
<b>Miller Postdoctoral Fellow</b> , University of California at Berkeley	2017 – 2020
<b>Graduate Research Assistant</b> , Harvard University	2012 – 2017

## AWARDS AND FELLOWSHIPS

UW Atmospheric and Climate Science Annual Teaching Award	2022, 2023
AGU James R. Holton Junior Scientist Award	2020
Miller Fellowship at UC Berkeley	2017 – 2020
Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCESS XIV)	2017
DOE Computational Science Graduate Fellowship (CSGF)	2013 – 2017
National Defense Science and Engineering Graduate (NDSEG) fellowship, <i>declined</i>	2013
CU Boulder College of Engineering's "Outstanding Graduate for Research"	2012
NOAA Ernest F. Hollings Scholar	2010 – 2012

## PUBLICATIONS (GROUP MEMBER, \*SUBMITTED, \*CONTRIBUTED EQUALLY)

- h-index = 27, total citations = 3,348 (*as of November 1, 2024: [scholar.google.com/citations?user=tfmVgv0AAAAAJ](https://scholar.google.com/citations?user=tfmVgv0AAAAAJ)*)
- \*51. Yoon, J. Y. S., K. Wells, D. B. Millet, A. L. S. Swann, J. A. Thornton, and **A. J. Turner** (submitted), Impacts of interannual isoprene variations on methane lifetimes and trends, *submitted*.
  - \*50. Liu, A. X., C. M. Zarakas, B. G. Buchovecky, L. R. Hawkins, A. Cordak, A. Cornish, M. Haagsma, G. J. Kooperman, C. J. Still, C. D. Koven, **A. J. Turner**, D. S. Battisti, J. T. Randerson, F. M. Hoffman, A. L. S. Swann (submitted), Photosynthesis responses to intrinsic water use efficiency depend on atmospheric feedbacks and modify the magnitude of response to elevated CO<sub>2</sub>, *submitted*.
  - \*49. N. Dadheech<sup>\*</sup>, T. He<sup>\*</sup>, and **A. J. Turner** (submitted), High-resolution greenhouse gas flux inversions using a machine learning surrogate model for atmospheric transport, *submitted*.
  - \*48. Jeong, S., S. D. Hamilton, D. Wu, M. S. Johnson, **A. J. Turner**, and M. L. Fischer (2024), Applying Gaussian Process Machine Learning and Modern Probabilistic Programming to Satellite Data to Infer CO<sub>2</sub> Emissions, *submitted*.
  - \*47. He, T.<sup>\*</sup>, G. M. Oomen<sup>\*</sup>, W. Tang, I. Bouarar, K. Chance, C. Clerbaux, D. Edwards, H. Eskes, B. Gaubert, C. Granier, M. Guevara, D. Jacob, J. Kaiser, J. Kim, S. Kondragunta, X. Liu, E. Marais, K. Miyazaki, R. Park, V. H. Peuch, G. Pfister, A. Richter, T. Stavrakou, R. M. Suleiman, **A. J. Turner**, B. Veihelmann, Z. C. Zeng, and G. Brasseur (submitted), Challenges and opportunities offered by geostationary space observations for air quality research and emission monitoring, *submitted*.
  - \*46. Liu, G., L. Shen, P. Ciais, X. Lin, D. Hauglustaine, X. Yi, X. Lan, **A. J. Turner**, and S. Peng (submitted), Increased Arctic natural emissions and tropical tropospheric hydroxyl radicals explain changes in seasonal amplitude of atmospheric CH<sub>4</sub>, *submitted*.
  - \*45. Johnson, M. S., S. D. Hamilton, S. Jeong, Y. Cui, D. Wu, **A. J. Turner**, and M. L. Fischer (submitted), State-wide California 2020 Carbon Dioxide Budget Estimated with OCO-2 and OCO-3 satellite data, *submitted*.
  - \*44. He, T.<sup>\*</sup>, N. Dadheech<sup>\*</sup>, T. M. Thompson, and **A. J. Turner** (submitted), FootNet v1.0: Development of a machine learning emulator of atmospheric transport, *submitted*.
  - 43. Hamilton, S. D., D. Wu, M. S. Johnson, **A. J. Turner**, M. L. Fischer, N. Dadheech, and S. Jeong (2024), Estimating carbon dioxide emissions in two California cities using Bayesian inversion and satellite measurements, *Geophys. Res. Lett.*, *e2024GL111150*, doi:10.1029/2024GL111150.

42. Dressel, I., S. Zhang, M. A. G. Demetillo, S. Yu, K. Fields, L. M. Judd, C. R. Nowlan, K. Sun, A. Kotsakis, **A. J. Turner**, and S. E. Pusede (2024), Neighborhood-level nitrogen dioxide inequalities contribute to surface ozone in Houston, Texas, *Env. Sci. Technol. Air*, *1*, 973–988, doi:10.1021/acsestair.4c00009.
41. Manchanda, C., R. Harley, J. D. Marshall, **A. J. Turner**, and J. S. Apte (2024), Integrating Mobile and Fixed-Site Black Carbon Measurements to Bridge Spatiotemporal Gaps in Urban Air Quality, *Env. Sci. Technol.*, *58*, 12563–12574, 10.1021/acs.est.3c10829.
40. Lee, B. H., J. M. Munger, S. C. Wofsy, L. V. Rizzo, J. Y. S. Yoon, **A. J. Turner**, J. A. Thornton, and A. L. S. Swann (2024), Sensitive response of atmospheric oxidative capacity to the uncertainty in the emissions of nitric oxide (NO) from soils in Amazonia, *Geophys. Res. Lett.*, *e2023GL107214*, doi:10.1029/2023GL107214.
39. Asimow, N. G., **A. J. Turner**, and R. C. Cohen (2024), Sustained reductions of Bay Area CO<sub>2</sub> emissions 2018–2022, *Env. Sci. Technol.*, *58*, 6586–6594, doi:10.1021/acs.est.3c09642.
38. He, T., R. J. Boyd, D. J. Varon, and **A. J. Turner** (2024), Increased methane emissions from oil and gas following the Soviet Union’s collapse, *Proc. Natl. Acad. Sci.*, *121*, doi:10.1073/pnas.2314600121.
37. Moon, A., U. Jongebloed, K. K. Dingilian, A. J. Schauer, Y. C. Chan, M. Cesler-Maloney, W. R. Simpson, R. J. Weber, L. Tsiang, F. Yazbeck, S. Zhai, A. Wedum, **A. J. Turner**, S. Albertin, S. Bekki, J. Savarino, K. Gribanov, K. A. Pratt, E. J. Costa, C. Anastasio, M. O. Sunday, L. M. D. Heinlein, J. Mao, and B. Alexander (2023), Primary Sulfate Is the Dominant Source of Particulate Sulfate During Winter in Fairbanks, Alaska, *Env. Sci. Technol. Air*, *1*, 139–149, doi:10.1021/acsestair.3c00023.
36. Yu, X., D. B. Millet, D. K. Henze, **A. J. Turner**, A. L. Delgado, A. A. Bloom, and J. Sheng (2023), A high-resolution satellite-based map of global methane emissions reveals missing wetland, fossil fuel, and monsoon sources, *Atmos. Chem. Phys.*, *23*, 3325–3346, doi:10.5194/acp-23-3325-2023.
35. Hajny, K. D., C. Floerchinger, I. Lopez-Coto, J. Pitt, C. Gately, K. Gurney, L. Hutyrá, T. Jayarathne, R. Kaeser, G. Roest, M. Sargent, B. H. Stirm, J. Tomlin, **A. J. Turner**, P. B. Shepson, and S. Wofsy (2022), Measurements of anthropogenic CO<sub>2</sub> emissions from New York City compared to inventories, *Elem. Sci. Anth.*, *10:1*, doi:10.1525/elementa.2021.00121.
34. Kim, J., **A. J. Turner**, H. Fitzmaurice, E. Delaria, C. Newman, P. J. Wooldridge, and R. C. Cohen (2022), Observing annual trends in vehicular CO<sub>2</sub> emissions, A gridded national inventory of US methane emissions, *Env. Sci. Technol.*, *56*, 3925–3931, doi:10.1021/acs.est.1c06828.
33. Gensheimer, J., **A. J. Turner**, P. Köhler, C. Frankenberg, and J. Chen (2022), A convolutional neural network for spatial downscaling of satellite-based solar-induced chlorophyll fluorescence (SIFnet), *Biogeosci.*, *19*, 1777–1793, doi:10.5194/bg-19-1777-2022.
32. Fitzmaurice, H., **A. J. Turner**, J. Kim, K. Chan, E. Delaria, C. Newman, P. J. Wooldridge, and R. C. Cohen (2022), Assessing vehicle fuel efficiency using a dense network of CO<sub>2</sub> observations, *Atmos. Chem. Phys.*, *22*, 3891–3900, doi:10.5194/acp-22-3891-2022.
31. Wang, X., J. A. Biederman, J. F. Knowles, R. L. Scott, **A. J. Turner**, M. P. Dannenberg, P. Köhler, C. Frankenberg, M. E. Litvak, G. N. Flerchinger, B. E. Law, H. Kwon, S. C. Reed, W. J. Parton, G. A. Barron-Gafford, and W. K. Smith (2022), Satellite solar-induced chlorophyll fluorescence and near-infrared reflectance observations capture complimentary aspects of dryland vegetation dynamics, *Remote Sens. Environ.*, *270*, 112858–112869, doi:10.1016/j.rse.2021.112858.
30. **Turner, A. J.**, P. Köhler, T. S. Magney, C. Frankenberg, I. Fung, and R. C. Cohen (2021), Extreme events driving year-to-year differences in gross primary productivity across the US, *Biogeosci.*, *18*, 6579–6588, doi:10.5194/bg-18-6579-2021.
29. Delaria, E. R., B. K. Place, **A. J. Turner**, Q. Zhu, X. Jin, and R. C. Cohen (2021), Development of a solar induced fluorescence-canopy conductance model and its application to stomatal reactive nitrogen deposition, *ACS Earth Space Chem.*, *5*, 3414–3428, doi:10.1021/acsearthspacechem.1c00260.
28. Laughner, J. L., J. L. Neu, D. Schimel, P. O. Wennberg, K. Barsanti, K. Bowman, A. Chatterjee, B. Croes, H. Fitzmaurice, D. K. Henze, J. Kim, E. A. Kort, Z. Liu, K. Miyazaki, **A. J. Turner**, S. Anenberg, J. Avise, H. Cao, D. Crisp, J. de Gouw, A. Eldering, J. Fyfe, D. L. Goldberg, K. R. Gurney, S. Hasheminassab, F. Hopkins, C. E. Ivey, D. B. A. Jones, J. Liu, N. S. Lovenduski, R. V. Martin, G. A. McKinley, L. Ott, B. Poulter, M. Ru, S. P. Sander, N. Swart, Y. L. Yung, Z. Zeng, and KISS COVID-19 workshop team (2021), Societal shifts due to COVID-19 reveal large-scale complexities and feedbacks between atmospheric chemistry and climate change, *Proc. Natl. Acad. Sci.*, *118*, doi:10.1073/pnas.2109481118.

27. Gensheimer, J., **A. J. Turner**, A. Shekhar, A. Wenzel, F. N. Keutsch, and J. Chen (2021), What are different measures of mobility changes telling us about emissions during the COVID-19 pandemic?, *J. Geophys. Res.*, *126*, doi:10.1029/2021JD034664.
26. **Turner, A. J.**, J. Kim, H. Fitzmaurice, C. Newman, K. Worthington, K. Chan, P. J. Wooldridge, P. Köhler, C. Frankenberg, and R. C. Cohen (2020), Observed impacts of COVID-19 on urban CO<sub>2</sub> emissions, *Geophys. Res. Lett.*, *47*, doi:10.1029/2020GL090037.
25. **Turner, A. J.**, P. Köhler, T. S. Magney, C. Frankenberg, I. Fung, and R. C. Cohen (2020), A double peak in the seasonality of California's photosynthesis as observed from space, *Biogeosci.*, *17*, 405–422, doi:10.5194/bg-17-405-2020.
24. Nguyen, N., **A. J. Turner**, Y. Yin, M. Prather, and C. Frankenberg (2020), Effects of chemical feedbacks on decadal methane emissions estimates, *Geophys. Res. Lett.*, *47*, doi:10.1029/2019GL085706.
23. **Turner, A. J.**<sup>\*</sup>, C. Frankenberg<sup>\*</sup>, and E. A. Kort<sup>\*</sup> (2019), Interpreting contemporary trends in atmospheric methane, *Proc. Natl. Acad. Sci.*, *116*, 2805–2813, doi:10.1073/pnas.1814297116.
22. Cusworth, D. H., D. J. Jacob, J. X. Sheng, J. Benmergui, **A. J. Turner**, J. Brandman, L. White, and C. A. Randles (2018), Detecting high-emitting methane sources in oil/gas fields using satellite observations, *Atmos. Chem. Phys.*, *18*, 16885–16896, doi:10.5194/acp-18-16885-2018.
21. **Turner, A. J.**, I. Fung, V. Naik, L. W. Horowitz, and R. C. Cohen (2018), Modulation of hydroxyl variability by ENSO in the absence of external forcing, *Proc. Natl. Acad. Sci.*, *115*, 8931–8936, doi:10.1073/pnas.1807532115.
20. Sheng, J. X., D. J. Jacob, **A. J. Turner**, J. D. Maasakkers, J. Benmergui, A. A. Bloom, C. Arndt, R. Gautam, D. Zavala-Araiza, H. Boesch, and R. J. Parker (2018), 2010–2016 methane trends over Canada, the United States, and Mexico observed by the GOSAT satellite: contributions from different source sectors, *Atmos. Chem. Phys.*, *18*, 12257–12267, doi:10.5194/acp-18-12257-2018.
19. **Turner, A. J.**, D. J. Jacob, J. Benmergui, J. Brandman, L. White, and C. A. Randles (2018), Assessing the capability of different satellite observing configurations to resolve the distribution of methane emissions at kilometer scales, *Atmos. Chem. Phys.*, *18*, 8265–8278, doi:10.5194/acp-18-8265-2018.
18. Sheng, J. X., D. J. Jacob, **A. J. Turner**, J. D. Maasakkers, M. P. Sulprizio, A. A. Bloom, A. E. Andrews, and D. Wunch (2018), High-resolution inversion of methane emissions in the Southeast US using SEAC<sup>4</sup>RS aircraft observations of atmospheric methane: anthropogenic and wetlands sources, *Atmos. Chem. Phys.*, *18*, 6483–6491, doi:10.5194/acp-18-6483-2018.
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. Heymenn, 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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. Bousseres, 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. Velasco, 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.

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## SELECTED INVITED SEMINARS

2024 NASA Ames Research Center  
 2023 California Institute of Technology (Caltech)  
 2023 University of Utah  
 2022 NASA Ames Research Center  
 2022 MIT Frontiers in Atmospheric Chemistry Seminar Series (FACSS)  
 2022 Stanford University  
 2022 NASA Goddard Space Flight Center  
 2022 NASA Ames Research Center  
 2022 University of Rochester  
 2021 Environment and Climate Change Canada  
 2021 University of Toronto  
 2021 UC Berkeley Climate and Impacts Group  
 2021 Imperial College  
 2020 NASA Jet Propulsion Laboratory (JPL)  
 2020 University of California at Berkeley  
 2020 University of Washington  
 2019 Bay Area Air Quality Management District (BAAQMD)  
 2019 OneNOAA Science Seminar

2018 Stanford University  
2018 University of California at Berkeley  
2018 Technical University of Munich (TUM), Germany  
2018 NASA Ames Research Center  
2018 NOAA Geophysical Fluid Dynamics Laboratory (GFDL)  
2018 University of Washington  
2017 Japanese Aerospace Exploration Agency (JAXA)  
2017 California Institute of Technology (Caltech)

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## SELECTED CONFERENCE PRESENTATIONS (<sup>†</sup>INVITED)

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2024<sup>†</sup> AGU Fall Meeting: Session on Tropospheric Oxidative Capacity, Washington, DC  
2024<sup>†</sup> AGU Fall Meeting: Session on Vintage Atmospheric Chemistry, Washington, DC  
2024<sup>†</sup> EPA Methane Inverse Modeling Technical Workshop, Durham, NC  
2024<sup>†</sup> Schmidt Sciences Cross-VESRI Convening, University of Cambridge, Cambridge, UK  
2024<sup>†</sup> Summer School for Inverse Modeling of Greenhouse Gases, Colorado State University (CSU)  
2023<sup>†</sup> AGU Fall Meeting, San Francisco, CA  
2023<sup>†</sup> Gordon Conference on Atmospheric Chemistry, Sunday River, ME  
2023 Telluride Science Workshop: Mapping Urban Air, Telluride, CO  
2023<sup>†</sup> Canadian Society for Chemistry (CSC) Symposium on Atmospheric Organics, Vancouver, Canada  
2022 AGU Fall Meeting, Chicago, IL  
2022 OCO-2 Science Team Meeting, virtual  
2021 Telluride Science Workshop: Mapping Urban Air, Telluride, CO  
2020<sup>†</sup> AGU Fall Meeting: James R. Holton Award talk in the Frontiers of Atmospheric Science session, virtual  
2020<sup>†</sup> AGU Fall Meeting: Union Session on COVID-19 in the Earth system, virtual  
2020 AGU Fall Meeting: Session on Solar-Induced Chlorophyll Fluorescence, virtual  
2020 Air Sensors International Conference (ASIC) Fall series, virtual  
2020<sup>†</sup> COVID-19: Identifying Unique Opportunities for Earth Science, Keck Institute for Space Studies, virtual  
2019<sup>†</sup> CO<sub>2</sub>-Urban Synthesis and Analysis (CO<sub>2</sub>-USA) Workshop, Boston University  
2019<sup>†</sup> Frontiers of Atmospheric Science and Chemistry (FASCINATE 2019), NCAR, Boulder, CO  
2019<sup>†</sup> Global Air Quality Sensing Forum, Berkeley, CA  
2017 AGU Fall Meeting, New Orleans, LA  
2017<sup>†</sup> UN Climate Change Conference (COP23), Bonn, Germany  
2017 Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCESS) XIV, Brookhaven National Lab  
2017<sup>†</sup> DOE Computational Science Graduate Fellowship Program Review, Washington, DC

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## TEACHING EXPERIENCE

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**University of Washington:** *Received the annual department teaching award in 2022 & 2023*

- ATMOS 340 (Atmospheric Thermodynamics, *undergraduate*): Winter 2023
- ATMOS 358 (Atmospheric Chemistry, *undergraduate*): Spring 2021, 2022, 2023, 2024
- ATMOS 501 (Atmospheric Physics & Chemistry, *graduate*): Autumn 2021, 2022, 2023, 2024
- ATMOS 532 (Atmospheric Radiation, *graduate*): Winter 2022
- Climate & Environmental Justice Faculty Development Workshop: Winter 2022, 2023

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## MENTORING

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### Postdocs:

- Dr. Tai-Long He (UW ATMOS), 2022 – 2024. Next Position: Postdoc at Harvard
  - Co-lead author on peer-reviewed publication in ACP (submitted 2024)
  - Co-lead author on peer-reviewed publication in BAMS (submitted 2024)
  - Co-lead author on peer-reviewed publication in GMD (submitted 2024)
  - Lead author on peer-reviewed publication in PNAS (2024)
  - 2024: Oral presentation at the AGU Fall Meeting in Washington, DC
  - 2024: Oral presentation at the ISSI-sponsored workshop on geostationary satellites, virtual
  - 2024: Oral presentation at the 20th IWGGMS meeting in Boulder, CO
  - 2024: Poster presentation at the UW Computing for the Environment Spring Symposium in Seattle, WA
  - 2023: Oral presentation at the AGU Fall Meeting in San Francisco, CA
  - 2023: Oral presentation in the Stanford Methane Emissions Technology Alliance, virtual
  - 2023: Poster presentation at the UW Computing for the Environment Spring Symposium in Seattle, WA
  - 2023: Oral presentation at the ISSI-sponsored workshop on geostationary satellites in Bern, Switzerland
  - 2022: Poster presentation at the AGU Fall meeting in San Francisco, CA

**Graduate students:**

- Eliot Kim (UW ATMOS), 2024 – *present*
- Eric Mei (UW ATMOS), 2023 – *present*
  - 2024: Oral presentation at the AGU Fall Meeting in Washington, DC
  - 2024: Poster presentation at the Graduate Climate Conference in Pack Forest, WA
  - 2024: Poster presentation at the UW Program on Climate Change Summer Institute
  - 2024: Poster presentation at the UW CS4Env Spring Symposium
- James Yoon (UW ATMOS; co-advised with Joel Thornton), 2022 – *present*
  - Lead author on peer-reviewed publication in PNAS (submitted 2024)
  - 2024: Poster presentation at the AGU Fall Meeting in Washington, DC
  - 2024: Poster presentation at the Graduate Climate Conference in Pack Forest, WA
  - 2024: Poster presentation at the International GEOS-Chem meeting in St Louis, MO
  - 2024: Poster presentation at the UW Computing for the Environment Spring Symposium in Seattle, WA
  - 2023: Oral presentation at the AGU Fall Meeting in San Francisco, CA
  - 2023: Poster presentation at the Graduate Climate Conference in Woods Hole, MA
- Nikhil Dadheech (UW ATMOS), 2021 – *present*
  - NASA FINESST graduate fellowship, 2022 – 2025
  - Co-lead author on peer-reviewed publication in ACP (submitted 2024)
  - Co-lead author on peer-reviewed publication in GMD (submitted 2024)
  - 2024: Poster presentation at the AGU Fall Meeting in Washington, DC
  - 2024: Oral presentation at the OCO-2/3 Science Team Breakout Meeting, virtual
  - 2024: Oral presentation at the AI4Carbon workshop, virtual
  - 2024: Poster presentation at the ICDC Meeting in Manaus, Brazil
  - 2024: Poster presentation at the 20th IWGGMS meeting in Boulder, CO
  - 2024: Oral presentation at the Transcom meeting in Boulder, CO
  - 2023: Poster presentation at the AGU Fall Meeting in San Francisco, CA
  - 2023: Poster presentation at the Graduate Climate Conference in Woods Hole, MA
  - 2023: Oral presentation in the NASA JPL Carbon Club seminar series, virtual
- Johannes Gensheimer (M.S. at TUM), 2020 – 2021. Next position: PhD student at MPI Jena
  - Lead author on peer-reviewed publication in JGR (2021)
  - Lead author on peer-reviewed publication BG (2021)
  - 2022: Oral presentation OCO-2 Science Team Meeting, virtual

**Undergraduates:**

- Coco Lipe (UW ATMOS; co-advised with Becky Alexander), 2024 – *present*
- Alyssa Tou (UW ATMOS), 2024 – *present*
- Max Taniguichi-King (UC Berkeley), Summer 2024.
  - 2024: Poster presentation at the AGU Fall Meeting in Washington, DC
- Lauren Yarrington (UW CS), 2023 – *present*
  - 2024: Poster presentation at the UW Computer Science Undergrad Research Symposium
  - 2024: Poster presentation at the UW Atmospheric Sciences Undergrad Research Symposium
- Laura Pong (UW ATMOS; co-advised with Abby Swann), 2023 – *present*
  - 2024: Poster presentation at the UW Undergrad Research Symposium
  - 2024: Poster presentation at the UW Atmospheric Sciences Undergrad Research Symposium
  - 2023: Poster presentation at the UW Atmospheric Sciences Undergrad Research Symposium
- Simon Zhang (UW AMATH), 2022 – 2023. Next Position: PhD student at U. Minnesota
- Ryan Boyd (UW ATMOS), 2021 – 2023. Next Position: PhD student at Princeton
  - Second author on peer-reviewed publication in PNAS (2024)
  - 2023: Poster presentation at the UW Atmospheric Sciences Undergrad Research Symposium
  - 2022: Poster presentation at the UW Atmospheric Sciences Undergrad Research Symposium

**Committees as member:**

- Ross Mower (UW CEE; GSR), Generals Exam 2024
- Amy Liu (UW ATMOS), MS Committee 2024
- Allison Moon (UW ATMOS), MS Committee 2023
- Randall Jones (UW ATMOS), MS Committee 2023
- Lucas Fifer (UW ESS; GSR), Generals Exam 2023
- Ursula Jongebloed (UW ATMOS), Generals Exam 2022
- Dr. Emily Tansey (UW ATMOS), Generals Exam 2022, PhD Committee 2024
- Dr. Carley Fredrickson (UW ATMOS), Generals Exam 2022, PhD Committee 2024
- Dr. Claire Zarakas (UW ATMOS), Generals Exam 2022, PhD Committee 2024
- Jiawen Liu (UW CEE), Generals Exam 2023, PhD Committee 2023
- Dr. Yuzhou Wang (UW CEE; GSR), Generals Exam 2023, PhD Committee 2023
- Dr. Shuting Zhai (UW ATMOS), Generals Exam 2021, PhD Committee 2023

- Dr. Susanna Michael (UW Ocean; GSR), PhD Committee 2022

## SERVICE ACTIVITIES

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### Departmental committees and duties:

- UW ATMOS computing committee member, 2024 – *present*.
- UW ATMOS assistant computing director search committee member, 2024 – *present*.
- UW ATMOS committee on graduate studies, 2023 – *present*.
- UW ATMOS faculty search committee member, 2023 – 2024.
- UW ATMOS strategic planning committee member, 2023.
- UW ATMOS teaching schedule committee member, 2022 – 2023.
- UW ATMOS graduate curriculum committee member, 2021 – 2023.

### College/University committees and duties:

- College scholarship committee member, 2024 – *present*.
- Co-Director of UW “Computing for the Environment” Initiative, 2022 – *present*.
- Facilitator of UW Climate & Environmental Justice Faculty Development Workshop, 2022 – 2023.
- UW faculty senator, 2021 – 2023.

### National committees and duties:

- Science team member for the NASA Carbon-I satellite mission concept, 2024 – *present*.
- Science team member for the NASA STRIVE satellite mission concept, 2024 – *present*.
- Committee member, National Academies Panel on “*Atmospheric Methane Removal*”, 2023 – 2024.
- Co-organizer, Telluride Science Research Conference on “*Mapping Urban Air: Linking Observations and Processes*”, 2021 & 2025.
- Team Lead, NASA Keck Institute for Space Sciences workshop on “*COVID-19 and the Earth System*”, 2021.
- Co-author, white paper from Microsoft Research workshop on Urban Futures: “*Why all cities should have ‘Clean Air as a City Service’*”, 2020.

### International committees and duties:

- Project lead for FETCH<sub>4</sub>, an international collaboration of scientists focused on improving our understanding of the past and modern methane cycle (19 institutions across 7 countries), 2023 – *present*.
- Lead chapter author, Japanese National Institute for Environmental Studies report: “*A guidebook on the use of satellite greenhouse gases observation data to evaluate and improve greenhouse gas emission inventories*”, 2018.
- Co-chair, session at AGU Fall Meeting, 2019, 2020.
- Guest editor for *PNAS*.
- Proposal reviewer for *NASA*, *NOAA*, *Schmidt Sciences*, and *Deutsche Forschungsgemeinschaft*.
- Peer reviewer for 14 scientific journals: *Science*, *PNAS*, *Science Advances*, *Nature Geoscience*, *Nature Climate Change*, *Geophysical Research Letters*, *Atmospheric Chemistry and Physics*, *Biogeosciences*, *Atmospheric Measurement Techniques*, *Geoscientific Model Development*, *Environmental Science & Technology*, *Earth’s Future*, *Journal of Geophysical Research*, and *GeoHealth*.

## RESEARCH GRANTS

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### FETCH<sub>4</sub>: Fate, Emissions, and Transport of CH<sub>4</sub> in past and modern atmospheres

\$10,000,000, Alexander J. Turner (lead PI; 19 institutions involved; \$2,973,876 to UW)

- Schmidt Futures: Virtual Earth System Research Institute (VESRI)
- May 1, 2023 – April 30, 2028

### Development and implementation of an atmospheric transport emulator in EDF’s Air Tracker

\$27,000, Alexander J. Turner (sole PI)

- Environmental Defense Fund (EDF)
- August 16, 2022 – July 31, 2023

### A dense air quality monitoring network in Seattle to address air pollution, climate, and equity

\$50,000, Alexander J. Turner

- University of Washington’s Computing for the Environment Initiative
- June 20, 2022 – June 19, 2023

### Development of a high-fidelity emulator of a full physics model for dense observing systems

\$576,965, Alexander J. Turner (sole PI)

- NASA Early Career Faculty (ECF) Grant 80NSSC21K1808
- October 12, 2021 – October 11, 2024

### 2020 California Carbon Dioxide Budget in a Changing Climate

\$808,506, Seonguen Jeong (PI); Turner is a Co-I (\$25,049)

- NASA ROSES Grant 80HQTR21T0101
- June 3, 2021 – June 2, 2024