DAVEN K. HENZE

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Education

University of Washington, Chemistry	B.S. (2001)
University of Washington, Chemical Engineering	B.S. (2001)
California Institute of Technology, Chemical Engineering	M.S. (2004)
California Institute of Technology, Chemical Engineering	Ph.D. (2007)

Appointments

2020-	Professor of Mechanical Engineering, University of Colorado, Boulder.
2019-	Adjunct Research Scientist, Lamont-Doherty Earth Observatory, Columbia University.
2015-2020	Associate Professor of Mechanical Engineering, University of Colorado, Boulder.
2009-2015	Assistant Professor of Mechanical Engineering, University of Colorado, Boulder.
2007-2009	Earth Institute Postdoctoral Fellow, Columbia University, NASA GISS.
2007	Postdoctoral Scholar, California Institute of Technology.

Fellowships and Awards

2024	**Outstanding Graduate Teaching Award** *Department of Mechanical Engineering, CU Boulder*
2021	**Outstanding Service Award** *Department of Mechanical Engineering, CU Boulder*
2017-	**S.P. Chip and Lori Johnson Faculty Fellowship** *Department of Mechanical Engineering, CU Boulder*
2015	**Outstanding Research Award** *Department of Mechanical Engineering, CU Boulder*
2014	**Provost's Faculty Achievement Award**, *CU Boulder*
2013	**Dean's Junior Faculty Performance Award** *College of Engineering, CU Boulder*
2013	**Woodward Outstanding Faculty Award** *Department of Mechanical Engineering, CU Boulder*
2012-2015	**Charles C. Gates Faculty Fellow** *Department of Mechanical Engineering, CU Boulder*
2012	**Outstanding Research Award** *Department of Mechanical Engineering, CU Boulder*
2012	**Sullivan-Carlson Innovation in Education Award** *College of Engineering, CU Boulder*
2011	**Outstanding Undergraduate Education Award** *Department of Mechanical Engineering, CU Boulder*
2010	**NASA New Investigator Program Grant**
2009	**EPA Early Career Grant**
2007	**Columbia University Earth Institute Postdoctoral Fellowship**
2007	**William and Sonya Davidow Graduate Fellow** *Awarded to top graduate student in Environmental Science at Caltech.*
2002-2003	**William H. Corcoran Memorial Fellowship for Chemical Engineering** *Provided funding for first year of graduate studies.*

Peer-reviewed Publications (Henze group members underlined)

2026 Nawaz, M. O., and **D. K. Henze**, Climate action has the potential to ameliorate, perpetuate, or exacerbate geopolitical air pollution inequalities, *Nat. Commun., in press*.

2026 Yu, X., J. G. Canadell, **D. K. Henze**, P. K. Patra, M. Saunois, X. Cen, X. Lan, B. Riddell-Young, T. Röckmann, B. B. Jackson, Methane isotopes alter tropical and subtropical methane emission estimates, *Nat. Commun., in revision*.

2026 Oomen, G.-M., J. Choi, J. Yu, K. Miyazaki, A. F. J. Arellano, T. Stavrakou, G. Dufour, D. B. A. Jones, J. Kaiser, **D. K. Henze**, C. Granier, Improved determination of atmospheric trace gas emissions through observation-based analysis techniques: the AMIGO global initiative, *submitted*.

2026 Hsu, C.-H., **D. K. Henze**, A. P. Mizzi, C. Harkins,, C. Lyu, O. R. Cooper, R. H. Schwantes, J. He, M. Li, S. Wang, C. E. Stockwell, C. Warneke, A. W. Rollins, E. M. Waxman, K. Zuraski, J. Peischl, S. Kondragunta, F. Li, C. Xu, R. B. Pierce, G. G. Abad, C. R. Nowlan, X. Liu, B. C. McDonald, Top-down estimates of U.S. NO_x emissions using TEMPO and TROPOMI NO_2 remote sensing observations with WRF-Chem/Chem-DART, *J. Geophys. Res.*, 131,2, e2025JD044223, https://doi.org/10.1029/2025JD044223.

2025 Tang, Z., P. Yang, K. Miyazaki, J. Worden, H. Worden, **D. K. Henze**, D. B. A. Jones, Z. Jiang, Global CO emissions and drivers of atmospheric CO evolution constrained by MOPITT satellite observations, *submitted*.

2025 Hsu, C.-H., **D. K. Henze**, A. P. Mizzi, C. Harkins,, C. Lyu, O. R. Cooper, R. H. Schwantes, J. He, M. Li, S. Wang, C. E. Stockwell, C. Warneke, A. W. Rollins, E. M. Waxman, K. Zuraski, J. Peischl, S. Kondragunta, F. Li, C. Xu, R. B. Pierce, G. G. Abad, C. R. Nowlan, X. Liu, B. C. McDonald, Top-down estimates of U.S. NO_x emissions using TEMPO and TROPOMI NO_2 remote sensing observations with WRF-Chem/Chem-DART, *submitted*.

2025 Peng, A., B. Ma, **D. K. Henze**, S. L. Miller, J. A. de Gouw, J. L. Jimenez, Is there an optimal wavelength for germicidal ultraviolet air disinfection? *submitted*.

2025 Rowland, S., R. Parks, L. Chillrud, J. Paisley, **D. K. Henze**, G. Milly, A. Fiore, J. Liu, B. Coull, M. Kioumourtzoglou, Characterizing Uncertainty of Annual $PM_{2.5}$ Concentrations in the Contiguous United States, 2010 – 2015, *submitted*.

2025 Wiser, F., S. Sen, Z. Wang, J. Lee-Taylor, K. C. Barsanti, J. Orlando, D. M. Westervelt, **D. K. Henze**, A. M. Fiore, A. Berman, R. Carter, V. F. McNeill, A graph theory-based algorithm for the reduction of atmospheric chemical mechanisms, *PNAS Nexus*, 4(9):pgaf273, https://doi.org/10.1093/pnasnexus/pgaf273.

2025 Sapper, B., S. Youn, **D. K. Henze**, M. Canagaratna, H. Stark, J. L. Jimenez, Positive matrix factorization of large real-time atmospheric mass spectrometry datasets using error-weighted randomized hierarchical alternating least squares, *Geosi. Model Dev.*, 18, 2891–2919, https://doi.org/10.5194/gmd-18-2891-2025.

2025 Hu, W, N. Lu, X. Wang, **D. K. Henze**, L. Zhang, T.-M. Fu, B. Zheng, Y. Zhao, Decoding heavy $PM_{2.5}$ and ozone pollution: A multi-year emission sensitivity and synoptic pattern analysis over Eastern China, *J. Geophys, Res.*, 130, 21, e2025JD044252, https://doi.org/10.1029/2025JD044252.

2025 Benavides, J., C. C.-G., V. Kumar, S. T. Rowland, L. G. Chillrud, T. Adeyeye, J. Paisley, B. Coull, **D. K. Henze**, R. V. Martin, A. M. Fiore, M.-A. Kioumourtzoglou, bneR: A collaborative workflow for air pollution exposure modeling and uncertainty characterization using the Bayesian Nonparametric Ensemble, *J. Environ. Manage.*, 375, 124061, https://doi.org/10.1016/j.jenvman.2025.124061.

2025 Wiecko, P., **D. K. Henze**, and M. O. Nawaz, Sector-, season-, and country-specific NO_2-associated health benefits from NO_x emission reductions, *Environ. Sci.& Technol. Air*, 2, 4, 700–709, https://doi.org/10.1021/acsestair.5c00012.

2025 Thongsame, W., **D. K. Henze**, R. Kumar, M. Barth, G. Pfister, Source attribution and health impact of $PM_{2.5}$ in Mainland Thailand, *GeoHealth*, 9, 9, e2024GH001315, https://doi.org/10.1029/2024GH001315.

2025 Choi, J., **D. K. Henze**, K. C. Wells, and D. B. Millet, Joint inversion of satellite-based isoprene and formaldehyde observations to constrain emissions of non-methane volatile organic compounds, *J. Geophys. Res.*, 130, 13, e2024JD042070, https://doi.org/10.1029/2024JD042070.

2025 Francoeur, C. B., **D. K. Henze**, J. He, C. Harkins, B. C. McDonald, Tracking ethane from space over a large US oil and gas region, *Geophys. Res. Lett.*, 52, 13, e2025GL115286, https://doi.org/10.1029/2025GL115286.

2025 Jin, L., J. Benoit, M. O. Nawaz, P. F. Rodrigues, P. Wiecko, J. Miller, G. Alvarez, **D. K. Henze**, L. Osipova, S. Anenberg, Global health benefits of policies to reduce on-road vehicle pollution through 2040, *Environ. Res. Lett.*, 20, 064005, https://doi.org/10.1088/1748-9326/adcd87.

2025 Gu, Y., **D. K. Henze**, and H. Liao, Sources of $PM_{2.5}$ exposure and health benefits of Clean Air Actions in Shanghai, *Environ. Int.*, 195, 109259, https://doi.org/10.1016/j.envint.2025.109259.

2025 Chen, Y., L. Zhu, S. Wang, **D. K. Henze**, T.-M. Fu, L. Zhang, X. Wang, Unraveling the complexities of ozone and $PM_{2.5}$ pollution in the Pearl River Delta region: Impacts of precursors emissions and meteorological factors, and effective mitigation strategies, *Atmos. Pollut. Res.*, 16, 2, https://doi.org/10.1016/j.apr.2024.102368.

2024 Chatterjee, D., R. V. Martin, Chi Li, D. Zhang, H. Zhu, **D. K. Henze**, J. H. Crawford, R. C. Cohen, L. N. Lamsal, A. Cede, Interpreting summertime hourly variation of NO_2 columns with implications for geostationary satellite applications, *Atmos. Chem. Phys.*, 24, 12687–12706, https://doi.org/10.5194/acp-24-12687-2024.

2024 Driscoll, C., J. B. Milford, **D. K. Henze**, M. D. Bell, Atmospheric reduced nitrogen: Sources, transformations, effects, and management, *J. Air Waste Manag. Assoc.*, 74(6), 362 – 415, https://doi.org/10.1080/10962247.2024.2342765.

2024 Wierman, S., B. Schichtel, J. Collett, G. R. Wentworth, C. Davidson, A. H. Legge, C. T. Driscoll, M. Bell, **D. K. Henze**, J. B. Milford, Discussion of "Atmospheric reduced nitrogen: Sources, transformations, effects, and management," *J. Air Waste Manag. Assoc.*, 74 (10), 688-698, https://doi.org/10.1080/10962247.2024.2396783.

2024 Lu, N., L. Zhang, X. Wang, Z. Liu, D. Li, J. Xu, H. Tan, M. Zhou, **D. K. Henze**, Assessing the nonlinearity of wintertime $PM_{2.5}$ formation in response to precursor emission changes in North China with the adjoint method, *Environ. Res. Lett.*, 19, 084048, https://doi.org/10.1088/1748-9326/ad60df.

2024 Hu, W., B. Zheng, **D. K. Henze**, Y. Zhao, Health burdens related to emission sources and cross-provincial air pollution in China, *npj Clim. Atmos. Sci.*, 7, 312, https://doi.org/10.1038/s41612-024-00869-x.

2024 Choi, J., **D. K. Henze**, M. O. Nawaz, and C. Malley, Source attribution of health burdens from ambient $PM_{2.5}$, O_3, and NO_2 exposure for assessment of South Korean national emission control scenarios by 2050, *GeoHealth*, 8, 8, e2024GH001042, https://doi.org/10.1029/2024GH001042.

2024 Thongsame, W., **D. K. Henze**, R. Kumar, M. Barth, G. Pfister, Evaluation of WRF-Chem $PM_{2.5}$ simulations in Thailand with different anthropogenic and biomass-burning emissions, *Atmos. Environ. X*, 23, 100282, https://doi.org/10.1016/j.aeaoa.2024.100282.

2024 Hsu, C.-H., **D. K. Henze**, A. P. Mizzi, G. G. Abad, J. He, C. Harkins, A. R. Naeger, C. Lyu, X. Liu, C. C. Miller, R. B. Pierce, M. S. Johnson, B. C. McDonald, An Observing System Simulation Experiment analysis of how well geostationary satellite trace-gas observations constrain NO_x emissions in the US, *J. Geophys. Res.*, 129, 2, e2023JD039323, https://doi.org/10.1029/2023JD039323.

2024 Hu, W., Y. Zhao, N. Lu, X. Wang, B. Zheng, **D. K. Henze**, L. Zhang, T.-M. Fu, S. Zhai, Changing responses of $PM_{2.5}$ and ozone to source emissions in the Yangtze River Delta using the adjoint model, *Environ. Sci. Technol.* 58 (1), 628-638, https://doi.org/10.1021/acs.est.3c05049.

2024 Dedoussi, I. C., **D. K. Henze**, S. D. Eastham, R. L. Speth, S. R. H. Barrett, Development of the adjoint of the GEOS-Chem unified tropospheric-stratospheric chemistry extension (UCX) in GEOS-Chem Adjoint v36, *Geosci. Model Dev.*, 17, 5689–5703, https://doi.org/10.5194/gmd-17-5689-2024.

2024 Mao, Y.-H., Y. Shang, H. Liao, H. Cao, Z. Qu, **D. K. Henze**, Sensitivities of ozone to its precursors during heavy ozone pollution events in the Yangtze River Delta using the adjoint method, *Sci. Total Environ.*, 925, 15, https://doi.org/10.1016/j.scitotenv.2024.171585.

2024 Lu, Z., J. Wang, Y. Wang, **D. K. Henze**, X, Chen, T. Sha, K. Sun, Aggravated surface O_3 pollution primarily driven by meteorological variation in South China during the early COVID-19 pandemic lockdown period, *Atmos. Chem. Phys.*, 24, 7793–7813, https://doi.org/10.5194/acp-24-7793-2024.

2023 **Henze, D. K.**, Effects of urban to regional emissions on the air pollution health burden in Europe, *The Lancet Public Health*, 8 (7), E480–E481, https://doi.org/10.1016/S2468-2667(23)00125-1.

2023 Nawaz, M. O., **D. K. Henze**, N. J. Huneeus, M. Osses, N. Álamos, M. A. Opazo, L. Gallardo, Sources of air pollution health impacts and co-benefits of carbon neutrality in Santiago, Chile, *J. Geophys. Res.*, 128, 19, e2023JD038808, https://doi.org/10.1029/2023JD038808.

2023 Gu, Y., **D. K. Henze**, M. O. Nawaz, and U. J. Wagner, Response of the ozone-related health burden in Europe to changes in local anthropogenic emissions of ozone precursors, *Environ. Res. Lett.* 18, 114034, https://doi.org/10.1088/1748-9326/ad0167.

2023 Jo, D. S., B. A. Nault, S. Tilmes, A. Gettelman, C. S. McCluskey, A. Hodzic, **D. K. Henze**, M. O. Nawaz, K. M. Fung, J. L. Jimenez, Global health and climate effects of organic aerosols from different sources, *Environ. Sci. Technol.*, 57, 37, 13793–13807 https://doi.org/10.1021/acs.est.3c02823.

2023 Gu, Y, **D. K. Henze**, M. O. Nawaz, H. Cao, and U. J. Wagner, Sources of $PM_{2.5}$-associated health risks in Europe and corresponding emission-induced changes during 2005-2015, *GeoHealth*, 7, e2022GH000767, https://doi.org/10.1029/2022GH000767.

2023 Nawaz, M. O., **D. K. Henze**, S. C. Anenberg, D. Ahn, D. L. Goldberg, C. Tessum, Z. A. Chafe, Sources of air pollution-related health impacts and benefits of radially applied transportation policies in 14 US cities, *Front. Sustain. Cities*, 5, https://doi.org/10.3389/frsc.2023.1102493.

2023 Yu, X., D. B. Millet, **D. K. Henze**, A. J. Turner, A. L. Delgado, A. A. Bloom, J. Sheng, A high-resolution satellite-based map of global methane emissions reveals missing wetland, fossil fuel, and monsoon sources, *Atmos. Chem. Phys.*, 23, 3325–3346, https://doi.org/10.5194/acp-23-3325-2023.

2023 Sokharavuth, P., S. Thiv, C. Nara, C. Him, S. Sokyimeng, **D. K. Henze**, R Holmes, J. C.I. Kuylenstierna, C. S. Malley, E. Michalopoulou, J. Slater, Air pollution mitigation assessment to inform Cambodia's first Clean Air Plan, *Environ. Res.*, 6, 220, 115230, https://doi.org/10.1016/j.envres.2023.115230.

2023 Nawaz, M. O., **D. K. Henze**, S. C. Anenberg, C. Braun, J. Miller, J., E. Pronk, A source apportionment and emission scenario assessment of $PM_{2.5}$ and O_3-related health impacts in G20 countries, *GeoHealth*, 7, e2022GH000713, https://doi.org/10.1029/2022GH000713.

2023 Lin, C.-A., Y. Zhang, G. Heath, **D. K. Henze**, M. Sengupta, C.-H. Lu, Improvement of aerosol optical depth data for localized solar resource assessment, *Solar Energy*, 249, 457–466, https://doi.org/10.1016/j.solener.2022.11.047.

2023 Wiser, F., B. Place, S. Sen, H. O. T. Pye, B. Yang, D. M. Westervelt, **D. K. Henze**, A. M. Fiore, V. F. McNeill, AMORE-Isoprene v1.0: A new reduced mechanism for gas-phase isoprene oxidation, *Geosci. Model Dev.*, 16, 1801–1821, https://doi.org/10.5194/gmd-16-1801-2023.

2023 Yang, B., F. C. Wiser, V. F. McNeill, A. M. Fiore, M. Tao, **D. K. Henze**, S. Senf, D. M. Westervelt, Implementation and evaluation of the automated model reduction (AMORE) version 1.1 isoprene oxidation mechanism in GEOS-Chem, *Environ. Sci.: Atmos.*, 3, 1820–1833, https://doi.org/10.1039/d3ea00121k.

2022 Chen, C., O. Dubovik, G. L. Schuster, M. Chin, **D. K. Henze**, T. Lapyonok, Z. Li, Y. Derimian, Y. Zhang, Multi-angular polarimetric remote sensing to pinpoint global aerosol absorption and direct radiative forcing, *Nature Commun.*, 13, 7459, https://doi.org/10.1038/s41467-022-35147-y.

2022 Shim, C., J. Han, **D. K. Henze**, M. W. Shephard, L. Zhu, N. Moon, S. K. Kharol, E. Dammers, K. Cady-Pereira, Impact of NH_3 emissions on particulate matter pollution in South Korea: A case study of the Seoul metropolitan area, *Atmosphere*, 13(8), 1227, https://doi.org/10.3390/atmos13081227.

2022 Kleiman, G, Susan Anenberg, Z. Chafe, D. C. Appiah, T. Assefa, A. Bizberg, T. Coombes, D. Cuestas, **D. K. Henze**, A. Kessler, I. Kheirbek, P. Kinney, M. Mahlatji, J. D. Marshall, S. Naidoo, N. Potwana, A. Rodriguez, C. W. Tessum, C. Thomas, Enhanced integration of health, climate and air quality management planning at the urban scale, *Front. Sustain. Cities*, 4, 934672, https://doi.org/10.3389/frsc.2022.934672.

2022 Tessum, M., S. Anenberg, Z. Chafe, **D. K. Henze** G. Kleiman, I. Kheirbek, J. Marshall, C. Tessum, Sources of ambient $PM_{2.5}$ exposure in 96 global cities, *Atmos. Environ.*, 286, 1, 119234, https://doi.org/10.1016/j.atmosenv.2022.119234.

2022 Fritz, T. M., I. C. Dedoussi, S. D. Eastham, R. L. Speth, **D. K. Henze**, S. R. H. Barrett, Identifying the ozone-neutral aircraft cruise altitude, *Atmos. Environ.*, 276, 1, 119057, https://doi.org/10.1016/j.atmosenv.2022.119057.

2022 Qu, Z, **D. K. Henze**, H. M. Worden, Zhe Jiang, B. Gaubert, N. Theys, W. Wang, Sector-based top-down estimates of NO_x, SO_2, and CO emissions in East Asia, *Geophys. Res. Let.*, 49, e2021GL096009, https://doi.org/10.1029/2021GL096009.

2022 Jiang, J., R. Zhu, K. Miyazaki, B. C. McDonald, Z. Klimont, B. Zheng, F. K. Boersma, Q. Zhang, H. Worden, J. R. Worden, **D. K. Henze**, D. B. A. Jones, K. F. Boersma, H. A.C. D. van der Gon, H. Eskes, Decadal variabilities in tropospheric nitrogen oxides over United States, Europe, and China, *J. Geophys. Res.*, 127, e2021JD035872, https://doi.org/10.1029/2021JD035872.

2022 Cao, H., **D. K. Henze**, K. Cady-Pereira, B. C. McDonald, C. Harkins, K. Sun, K. W. Bowman, T.-M. Fu, O. Nawaz, COVID-19 lockdowns afford the first satellite-based confirmation that vehicles are an under-recognized source of urban NH_3 pollution in Los Angeles, *Environ. Sci. Technol. Lett.*, 9, 1 – 3, https://doi.org/10.1021/acs.estlett.1c00730.

2022 Lee, S., C. H. Song, K. M. Han, **D. K. Henze**, K. Lee, J. Yu, J.-H. Woo, J. Jung, Y. Choi, P. E. Saide, G. R. Carmichael, Impacts of uncertainties in emissions on aerosol data assimilation and short-term $PM_{2.5}$ predictions over Northeast Asia, *Atmos. Environ.*, 271, 118921, https://doi.org/10.1016/j.atmosenv.2021.118921.

2022 Choi, J., **D. K. Henze**, H. Cao, C. R. Nowlan, G. González Abad, H.-A. Kwon, H.-M. Lee, Y. J. Oak, R. J. Park, K. H. Bates, J. D. Maasakkers, A. Wisthaler, A. J. Weinheimer, An inversion framework for optimizing non-methane VOC emissions using remote sensing and airborne observations in Northeast Asia during the KORUS-AQ field campaign, *J. Geophys. Res.*, 127, e2021JD035844, https://doi.org/10.1029/2021JD035844.

2022 Cao, H., **D. K. Henze**, L. Zhu, M. W. Shephard, K. Cady-Pereira, E. Dammers, M. Sitewell, M. Alvarado, C. Lonsdale, J. Bash, K. Miyazaki, C. Flechard, Y. Fauvel, R. W. Kruit, S. Feigenspan, C. Brümmer, F. Schrader, M. M. Twigg, Y. S. Tang, A. C. M. Stephens, K. Vincent, M. Meier, E. Seitler, C. Geels, T. Ellermann, S. L. Capps, 4D-Var inversion of European NH_3 emissions using CrIS NH_3 measurements and GEOS-Chem adjoint with bi-directional and uni-directional flux schemes, *J. Geophys. Res.*, 127, e2021JD035687, https://doi.org/10.1029/2021JD035687.

2021 Nawaz, M. O., **D. K. Henze**, C. Harkins, H. Cao, B. Nault, D. Jo, J. Jimenez, S.C. Anenberg, D.L. Goldberg, Z. Qu, Impacts of sectoral, regional, species, and day-specific emissions on air pollution and public health in Washington DC, *Elementa*, 9 (1), 00043, https://doi.org/10.1525/elementa.2021.00043.

2021 Yu, X., D. B. Millet, and **D. K. Henze**, How well can inverse analyses of high-resolution satellite data resolve heterogenous methane fluxes? *Geosci. Model Dev.*, 14, 7775–7793, https://doi.org/10.5194/gmd-14-7775-2021.

2021 Li, M., B. C. McDonald, S. A. McKeen, H. Eskes, P. Levelt, C. Francoeur, C. Harkins, J. He, M. Barth, **D. K. Henze**, M. M. Bela, M. Trainer, J. A. de Gouw, G. J. Frost, Assessment of updated Fuel-based emissions inventories over the contiguous United States using TROPOMI NO2 retrievals, *J., Geophys. Res.*, 126, e2021JD035484, https://doi.org/10.1029/2021JD035484.

2021 Chen, Y., L. Zhang, **D. K. Henze**, Y. Zhao, X. Lu, W, Winiwarter, Y. Guo, X. Liu, Z. Wen, Y. Pan, Y. Song, Interannual variation of reactive nitrogen emissions and their impacts on $PM_{2.5}$ air pollution in China during 2005-2015, *Environ. Res. Lett.*, 16, 125004, https://doi.org/10.1088/1748-9326/ac3695.

2021 Malley, C. S., W. K. Hicks, J. C. I. Kulyenstierna, E. Michalopoulou, A. Molotoks, J. Slater, C. G Heaps, S. Ulloa, J. Veysey, D. T. Shindell, **D. K. Henze**, O. Nawaz, S. C. Anenberg, B. Mantlana, T. P. Robinson, Integrated assessment of global climate, air pollution, and dietary, malnutrition and obesity health impacts of food production and consumption between 2014 and 2018, *Environ. Res. Commun.*, 3, 075001, https://doi.org/10.1088/2515-7620/ac0af9.

2021 Stanevich, I., D. B. A. Jones, K. Strong, M. Keller, **D. K. Henze**, R. J. Parker, H. Boesch, D. Wunch, J. Notholt, C. Petri, T. Warneke, R. Sussmann, M. Schneider, F. Hase, R. Kivi, N. M. Deutscher, V. A. Velazco, K. A. Walker, F. Deng, Characterizing model errors in chemical transport modelling of methane: Using GOSAT XCH4 data with weak constraint four-dimensional variational data assimilation, *Atmos. Chem. Phys.*, 9545–9572, https://doi.org/10.5194/acp-21-9545-2021.

2021 Laughner, J. L., J. L. Neu, D. Schimel, P. O. Wennberg, K. Barsanti, K. Bowman, A. Chatterjeee, 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. C. Fyfe, D. L. Goldberg, K. R. Gurney, S. Hasheminassab, F. Hopkins, C. E. Ivey, D. B.A. Jones, N. S. Lovenduski, R. V. Martin, B. A. McKinley, L. Ott, B. Poulter, M. Rua, S. P. Sander, N. Swart, Y. L. Yung, Z.-C. Zeng, and the rest of the Keck Institute for Space Studies "COVID-19: Identifying Unique Opportunities for Earth System Science" study team, Societal shifts due to COVID-19 reveal large-scale complexities and feedbacks between atmospheric chemistry and climate change, *Proc. Nat. Acad. Soc.*, 118 (46), https://doi.org/10.1073/pnas.2109481118.

2021 Yu, X., D. B. Millet, K. C. Wells, **D. K. Henze**, H. Cao, T. J. Griffis, E. A. Kort, G. Plant, M. J. Deventer, R. K. Kolka, D. T. Roman, K. J. Davis, A. R. Desai, B. C. Baier, K. McKain, A. C. Czarnetzki, A. A. Bloom, Aircraft-based inversions quantify the importance of wetlands and livestock for Upper Midwest methane emissions, *Atmos. Chem. Phys.*, 21, 951–971, https://doi.org/10.5194/acp-21-951-2021.

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2012 Bowman, K. W., and **D. K. Henze**, Attribution of direct ozone radiative forcing to spatially-resolved emissions, *Geophys. Res. Lett.* 39, L22704, doi:10.1029/2012GL053274.

2012 **Henze, D. K.**, D. T. Shindell, F. Akhtar, R. J. D. Spurr, R. W. Pinder, D. Loughlin, M. Kopacz, K. Singh, and C. Shim, Spatially refined aerosol direct radiative forcing efficiencies, *Environ. Sci. Technol.*, 46, 9511 - 9518, dx.doi.org/10.1021/es301993s.

2012 Millet, D. B., E. Apel, **D. K. Henze**, J. Hill, J. D. Marshall, H. B. Singh, and C. W. Tessum, Natural and anthropogenic ethanol sources in North America and potential atmospheric impacts of ethanol fuel use, *Environ. Sci. Technol.*, 46, 8484-8492, dx.doi.org/10.1021/es300162u.

2012 Wang, J., X. Xu, **D. K. Henze**, Q. Ji, S.-C. Tsay, and J. Huang, Top-Down Estimate of Dust Emissions through Integration of MODIS and MISR Aerosol Retrievals with the GEOS-Chem adjoint model, *Geophys. Res. Lett.*, 39, L08802, doi:10.1029/2012GL051136.

2012 Turner, A., **D. K. Henze**, R. V. Martin, and A. Hakami, The spatial extent of source influences on modeled column concentrations of short-lived species, *Geophys. Res. Lett.*, 39, L12806, doi:10.1029/2012 GL051832.

2012 Walker, T., D. B. A. Jones, M. Parrington, **D. K. Henze**, L. T. Murray, J. W. Bottenheim, K. Anlauf, J. R. Worden, K. W. Bowman, C. Shim, K. Singh, M. Kopacz, D. W. Tarasick, J. Davies, P. von der Gathen, and C. C. Carouge, Impacts of midlatitude precursor emissions and local photochemistry on ozone abundances in the Arctic, *J. Geophys. Res.*, 117, D01305 , doi:10.1029/2011JD016370.

2012 Capps, S. L., **D. K. Henze**, A. Hakami, A. G. Russell, and A. Nenes, ANISORROPIA: the adjoint of the aerosol thermodynamic model ISORROPIA, *Atmos. Chem. Phys.*, 12, 527-543.

2012 Parrington, M., P. I. Palmer, **D. K. Henze**, D. W. Tarasick, E. J. Hyer, R. C. Owen, C. Clerbaux, K. W. Bowman, M. N. Deeter, E. M. Barratt, P.-F. Coheur, D. Hurtmans, M. George, and J. R. Worden, The influence of boreal biomass burning emissions on the distribution of tropospheric ozone over North America and the North Atlantic during 2010, *Atmos. Chem. Phys.*, 12, 2077-20983.

2012 Paulot, F., **D. K. Henze**, and P. O. Wennberg, Impact of the isoprene photochemical cascade on tropical ozone, *Atmos. Chem. Phys.*, 12, 1307-1325.

2012 Fu, T.-M., J. J. Ca, X. Y. Zhang, S. C. Lee, Q. Zhang, Y. M. Han, W. J. Qu, Z. Han, R. Zhang, Y. X. Wang, D. Chen, and **D. K. Henze**, Carbonaceous Aerosols in China: Top-down Constraints on Primary Sources and Estimation of Secondary Contribution, *Atmos. Chem. Phys.*, 12, 2725-2746.

2012 Wecht, K. J., D. J. Jacob, S. C. Wofsy, E. A. Kort, J. R. Worden, S. S. Kulawik, **D. K. Henze**, M. Kopacz, and V. H. Payne, Validation of TES methane with HIPPO aircraft observations: implications for inverse modeling of methane sources, *Atmos. Chem. Phys.*, 12, 1823-1832.

2011 Jiang, Z., D. B. A. Jones, M. Kopacz, J. Liu, **D. K. Henze**, and C. Heald, Quantifying the impact of model errors on the top-down down estimates of carbon monoxide emissions using satellite observations, *J. Geophys. Res.*, 116, D15306, doi:10.1029/2010JD015282.

2011 Kopacz, M., D. L. Mauzerall, J. Wang, E. M. Leibensperger, **D. K. Henze**, and K. Singh, Origin and radiative forcing of black carbon transported to the Himalayas and Tibetan Plateau, *Atmos. Chem. Phys.*, *11*, 2837-2852.

2011 Pinder, R. W., J. T. Walker, J. O. Bash, K. E. Cady-Pereira, **D. K. Henze**, M. Luo, G. B. Osterman, and M. W. Shephard, Quantifying spatial and seasonal variability in atmospheric ammonia with in situ and space-based observations, *Geosphys. Res. Let.*, 38, L04802, doi:10.1029/2010GL046146.

2011 Shephard, M. W., K. E. Cady-Pereira, M. Luo, **D. K. Henze**, R. W. Pinder, J. T. Walker, C. P. Rinsland, J. O. Bash, L. Zhu, V. H. Payne, and L. Clarisse, TES ammonia retrieval strategy and global observations of the spatial and seasonal variability of ammonia, *Atmos. Chem. Phys.* 11, 10743-10763.

2010 Kopacz, M., D. J. Jacob, J. A. Fisher, J. A. Logan, L. Zhang, I. A. Megretskaia, R. M. Yantosca, K. Singh, **D. K. Henze**, J. P. Burrows, M. Buchwitz, I. Khlystova, W. W. McMillan, J. C. Gille, D. P. Edwards, A. Eldering, V. Thouret, and P. Nedelec, Global estimates of CO sources with high resolution by adjoint inversion of multiple satellite datasets (MOPITT, AIRS, SCIAMACHY, TES), *Atmos. Chem. Phys.*, *10*, 855–876.

2009 **Henze, D. K.**, J. H. Seinfeld, and D. T. Shindell, Inverse modeling and mapping U.S. air quality influences of inorganic $PM_{2.5}$ precursor emissions with the adjoint of GEOS-Chem, *Atmos. Chem. Phys.*, 9, 5877–5903.

2009 Zhang, L., D. J. Jacob, M. Kopacz, **D. K. Henze**, and D. A. Jaffe, Intercontinental source attribution of ozone pollution at western U.S. sites using an adjoint method, *Geophys. Res. Let.*, *36*, L11810, doi:10.1029/2009GL037950.

2009 Kopacz, M., D. Jacob, **D. K. Henze**, C. L. Heald, D. G. Streets, and Q. Zhang, A comparison of analytical and adjoint Bayesian inversion methods for constraining Asian sources of CO using satellite (MOPITT) measurements of CO columns, *J. Geophys. Res.*, *114*, D04305, doi:10.1029/2007JD009264.

2009 Pye, H. O. T., J. H. Seinfeld, H. Liao, S. Wu, L. J. Mickely, D. J. Jacob, and **D. K. Henze**, Effect of changes in climate and emissions on future sulfate-nitrate-ammonium aerosol levels in the United States, *J. Geophys. Res.*, *114*, D01205, doi:10.1029/2008JD010701.

2009 Eller, P., K. Singh, A. Sandu, K. Bowman, **D. K. Henze**, and M. Lee, Implementation and evaluation of an array of chemical solvers in a global chemical transport model, *Geosci. Mod. Devel.*, *2*, 185-207.

2008 Fu, T.-M., D. J. Jacob, F. Wittrock, J. P. Burrows, M. Vrekoussis, and **D. K. Henze**, Global budgets of atmospheric glyoxal and methylglyoxal, and implications for formation of secondary organic aerosols, *J. Geophys. Res.*, 113, D15303, doi:10.1029/2007JD009505.

2008 **Henze, D. K.**, J. H. Seinfeld, N. G. Ng, J. H. Kroll, T.-M. Fu, D. J. Jacob, and C. L. Heald, Global modeling of secondary organic aerosol formation from aromatic hydrocarbons: High- vs low-yield pathways, *Atmos. Chem. Phys.*, 8, 2405-2420.

2008 Heald, C. L., **D. K. Henze**, J. H. Seinfeld, L. W. Horowitz, J. Feddema, J-F. Lamarque, A. Guenther, P. G. Hess, F. Vitt, A. H. Goldstein, and I. Fung, Predicted change in secondary organic aerosol concentrations in response to future climate, emissions, and land-use change, *J. Geophys. Res.*, 113, D05211, doi:10.1029/2007JD009092.

2007 Zhang, Y., J.-P. Huang, **D. K. Henze**, and J. H. Seinfeld, The role of isoprene in secondary organic aerosol formation on a regional scale, *J. Geophys. Res.*, 112, D20207, doi:10.1029/2007JD008675.

2007 **Henze, D. K.**, A. Hakami and J. H. Seinfeld, Development of the adjoint of GEOS-Chem, *Atmos. Chem. Phys.*, 7, 2413-2433.

2007 Hakami, A., **D. K. Henze**, J. H. Seinfeld, K. Singh, A. Sandu, S. Kim, D. Byun, and Q. Li, The adjoint of CMAQ, *Environ. Sci. Technol.*, 41(22), 7807-7818, doi:10.1021/es070944p.

2006 Liao, H., **D. K. Henze**, J. H. Seinfeld, W. Shiliang, and L. J. Mickley, Biogenic secondary organic aerosol over the United States: comparison of climatological simulations with observations, *J. Geophy. Res.*, 112, D06201, doi:10.1029/2006JD007813.

2006 **Henze, D. K.**, and J. H. Seinfeld, Global secondary organic aerosol formation from isoprene oxidation, *Geophys. Res. Let.*, 33, L09812, doi:10.1029/2006GL025976.

2005 Sandu, A., W. Liao, G. R. Carmichael, **D. K. Henze**, and J. H. Seinfeld, Inverse modeling of aerosol dynamics using adjoints: Theoretical and numerical considerations, *Aerosol Sci. Tech.*, 39, 677-694, doi:10.1080/02786820500182289.

2005 Hakami, A., **D. K. Henze**, J. H. Seinfeld, T. Chai, Y. Tang, G. R. Carmichael, and A. Sandu, Adjoint inverse modeling of black carbon during the Asian Pacific Regional Aerosol Characterization Experiment, *J. Geophys. Res.*, 110, D14301, doi:10.1029/2004JD005671.

2004 **Henze, D. K.**, J. H. Seinfeld, W. Liao, A. Sandu, and G. R. Carmichael, Inverse modeling of aerosol dynamics: Condensational growth, *J. Geophys. Res.*, 109, D14201, doi:10.1029/2004JD004593.

2004 Tantillo, D. J., R. Hoffmann, K. N. Houk, P. M. Warner, E. C. Brown, and **D. K. Henze**, Extended barbaralanes: Sigmatropic shiftamers or alpha-polyacenes? *J. Am. Chem. Soc.*, 126, 13, 4256-4263.

2002 Brown, E. C., **D. K. Henze**, and W. T. Borden, Are 1,5-disubstituted semibullvalenes that have C-2v equilibrium geometries necessarily bishomoaromatic?, *J. Am. Chem. Soc.*, 124, 50, 14977-14982.

Books and additional publications

2021 Sandu, A., **D. K. Henze**, and G. Carmichael, *Dynamic Data Assimilation for Atmospheric Composition: Advances and Perspectives*, in DDDAS-Book-II – Handbook on Dynamic Data Drive Application Systems (DDDAS) (Vol. II), *submitted.*

2020 Saide, P., **D. K. Henze**, A. Benedetti, M. Bocquet, G. Carmichael, A. da Silva, A. Inness, L. Johansson, A. Karppinen, M. Pagowski, A. Sandu, M. Sofiev, Y. Zhang, *Bias Correction and Forecast Skill Improvement Methods*, Ch. 10 of Training Materials and Best Practices for Chemical Weather/Air Quality Forecasting, World Meteorological Organization (WMO), ETR- No. 26.

2018 Baumgardner D, de Fatima Andrade M, Klimont Z , Kuylenstierna J, Carvalho SM, Borgford-Parnell N, Mayol-Bracero OL, Melamed M, et al., *Short-lived climate pollutants: Drivers, regional emissions and measurements*. In: Integrated Assessment of Short-lived Climate Pollutants in Latin America and the Caribbean: Improving air quality while contributing to climate change mitigation. pp. 18-53 Paris: United Nations Environment Programme (UNEP) and Climate and Clean Air Coalition (CCAC). ISBN 978-92-807-3549-9

2016 **Henze, D. K.**, *Source-apportionment methods*, in Using Satellite Data for Air Quality Management, Ed. M. Estes, https://aqast.wisc.edu/source-apportionment-methods.htm

2015 Bash, J. O., J. T. Walker, M. W. Shephard, K. E. Cady-Pereira, **D. K. Henze**, D. Schwede, L. Zhu, E. J. Cooter, Modeling reactive nitrogen in North America: recent developments, observational needs and future directions, *EM Magazine*, Sep.

2014 Mickley, L. J., A. M. Fiore, and **D. K. Henze**, Interactions between Climate Change and U.S. Air Quality, *Environ. Manag.*, 30, February.

2010 Napelenok, S. L., J. Arnold, K. M. Foley, and **D. K. Henze**, Regional Background Fine Particulate Matter, *Air pollution modeling and its application XX*, NATO Science for Peace and Security Series B-Physics and Biophysics, Springer, 277-280.

2002 Epiotis, N. D. and **D. K. Henze**, The Periodic Table, *Encyclopedia of Physical Science and Technology*, Academic Press, R. A. Meyers.

Professional Societies and Service

2025 International Workshop on Air Quality Forecasting Research, session co-chair, virtual, Jun 16-19.

2025 Terra Science Assessment and Instrument Prioritization Meeting, NASA HQ, February 10.

2024-2025 US EPA Clean Air Scientific Advisory Committee (CASAC) for primary O_3 standards.

2023 Co-Chair session *Advances in Regional and Global Scale Aerosol Modeling*, International Aerosol Modeling Algorithms (IAMA), Davis, CA, Dec 6 - 8.

2022-2025 US EPA Clean Air Scientific Advisory Committee (CASAC) for secondary SOx/NOx standards.

2022-2025 US EPA Clean Air Scientific Advisory Committee (CASAC) for Lead.

2019 Co-Chair session *Data Assimilation and Inverse Modeling of the Atmospheric Composition Applications*, AGU Fall Meeting, San Francisco, CA.

2019 Co-Chair session *Systems Approach to a Clean Environment*, EU-US, National Academy of Science Frontiers of Engineering Symposium, Stockholm, Sweden, Nov 18-20.

2019 Co-Chair sessions *Data Assimilation and Inverse Modeling* and *New and Innovative Modeling Techniques: Machine Learning, New Computational Methods/GPUs, Exposure Estimate Improvement, Data Simulation*, Meteorology and Climate - Modeling for Air Quality (MAC-MAQ), Davis, CA, Sep 11 - 13.

2019- Analysis of Emissions Using Observations (AMIGO) Steering Committee

2019- Multi-scale Chemistry Modeling (MUSICA) Advisory Panel Member and Evaluation and Data Assimilation Working Group Co-Chair.

2018 Co-Chair session *Data Assimilation and Inverse Modeling of the Atmospheric Composition Applications*, AGU Fall Meeting, Washington D. C.

2017 Co-Chair session *Data Assimilation and Inverse Modeling of the Atmospheric Composition Applications*, AGU Fall Meeting, New Orleans, LA.

2017-2022 NASA Earth Science Advisory Committee

2016 Co-Chair session *Data Assimilation and Inverse Modeling of the Atmospheric Composition Applications*, AGU Fall Meeting, San Francisco, CA.

2015-2021 US EPA Clean Air Scientific Advisory Committee (CASAC) for secondary SOx/NOx standards.

2015 Co-Chair session *Data Assimilation and Inverse Modeling for Atmospheric Composition Applications*, AGU Fall Meeting, San Francisco, CA.

2014 Co-Chair session *Energy and Climate*, CMAS Conference, Chapel Hill, NC, Oct 27 - 29.

2014 Participant in WHO Expert Workshop on Integrated Health Assessment Tools, Bonn, May 11 - 14.

2012-2015 Work Package Lead *2.6: Comparison of source-receptor and source-attribution methods*, United Nations Task Force on Hemispheric Transport of Atmospheric Pollutants (HTAP).

2011 Organizing Committee and session Co-Chair (Aerosol Thermodynamics and Dynamics), International Aerosol Modeling Algorithms Conference, Davis, CA, Nov 30 - Dec 2.

2011-2018 Co-chair Emissions Working Group for GEO-CAPE Science Team.

2010 Co-Chair session *Measuring Earth-Atmosphere Fluxes and Tropospheric Composition from Space*, AGU Fall Meeting, San Francisco, CA.

2009- GEOS-Chem Adjoint Model Scientist and member of GEOS-Chem Steering Committee.

2005- Member of American Geophysical Union (AGU).

University Service

2024 Faculty Search Committee (Computational Engineering)

2023 Faculty Search Committee (Air Quality)

2023 Personnel Committee (Fall 2023, ad hoc)

2022- Mechanical Engineering Associate Chair and Graduate Program Chair

2022 Staff Search Committee (Graduate Advisor)

2021 Staff Search Committee (Undergraduate Advisor)

2021 Mechanical Engineering Diversity Equity and Inclusion Action Grants review committee.

2020-2021 Mechanical Engineering Associate Chair and Undergraduate Program Chair

2020- Mechanical Engineering Executive Committee

2020-2021 Diversity, Equity, and Inclusion Committee

2018-2020 Mechanical Engineering Undergraduate Committee

2018 Fluid Dynamics Preliminary Exam Committee

2017-2018 College of Engineering Search Committee (Robotics and Controls)

2017-2019 Mechanical Engineering Personnel Committee

2017 Fluid Dynamics Preliminary Exam Committee

2015-2016 Mechanical Engineering Associate Chair and Undergraduate Program Chair

2015 Staff Search Committee Chair (Instructor)

2015 Staff Search Committee Chair (Undergraduate Advisor)

2015 Fluid Dynamics Preliminary Exam Committee

2014-2016 Mechanical Engineering Executive Committee

2014 Faculty Search Committee (Fluids)

2014 Staff Search Committee (Undergraduate Advisor)

2013 Staff Search Committee (Financial Manager)

2012-2015 Chair of Undergraduate Student Affairs and Professionalism Subcommittee

2012 Fluid Dynamics and Air Quality Preliminary Exam Committees

2012	Faculty Search Committee (Fluids)
2011	Fluid Dynamics and Air Quality Preliminary Exam Committees
2010-2012	Student Affairs and Professionalism Subcommittee
2010	Undergraduate Curriculum and Assessment Subcommittee
2010	Fluid Dynamics Preliminary Exam Committee
2009	Graduate Committee

Research Advisors

2007-2009	Earth Institute Postdoctoral Fellow, Columbia University, NASA GISS. Advisor: Dr. Drew Shindell.
2007	Postdoctoral Scholar, California Institute of Technology. Advisor: Prof. John H. Seinfeld.
2007	Ph.D., California Institute of Technology. Advisor: Prof. John H. Seinfeld. Additional Thesis Committee members: Prof. Richard Flagan (Caltech), Prof. Tapio Schneider (Caltech), Prof. Qinbin Li (UCLA).

Research Mentees

Postdocs	Dr. Masayuki Takeuchi Dr. Nazrul Islam (Co-advised with O. Cooper)
PhD	Patrick Wiecko Betsy Ferris Sean Youn Jennifer Wu Jeong Eun Kim Pedro de Melo (co-advised with L. Bruhwiler) Kate Rodelli (co-advised with Kelvin Bates)
Undergrad	Andrew Hansel
Staff	Yanko Davila, Scientific Programmer, part-time
Alumni	Dr. Colby Francoeur (Ph.D. 2020 - 2025, co-advised with B. McDonald at NOAA, next a postdoc at SRON) Dr. Worapop Thongsame (Ph.D. 2020 - 2025, co-advised with G. Pfister, R. Kumar, M. Barth at NCAR, next a postdoc at NARIT) Dr. Chia-Hua Hsu (Ph.D. 2019 - 2025, co-advised with B. McDonald at NOAA, next a postdoc at NIES) Dr. Jinkyul Choi (Ph.D., 2018 - 2024, next a Postdoc at NASA JPL) Dr. Yixuan Gu (Postdoc, 2021 - 2024, co-advised with Dr. Ulrich Wagner at Mannheim University, next faculty at NUIST) Dr. Xueying Yu (Ph.D. 2022, co-advised remotely with D. Millet at University of Minnesota, next a Postdoc at Stanford) Dr. Omar Nawaz (Ph.D. 2022, next a Postdoc at George Washington University) Dr. Hansen Cao (Postdoc 2018-2022, next a Postdoc at University of York) Dr. William Tsui (Postdoc 2020-2022, next research scientist at EPA) Dr. Zhen Qu (Ph.D. 2019, next a Postdoc at Harvard)

Dr. Nicolas Bousserez (Posdoc 2011-2018, next a research scientist at ECMWF)
Dr. Azadeh Keshavarzmohammadian (Ph.D. 2018)
Dr. Jonathan Guerrette (Ph.D. 2016, next a Postdoc at NOAA)
Dr. Sojin Lee (Postdoc 2017 - 2018)
Dr. Shannon Capps (Postdoc 2014 - 2016, co-advised with J. Milford, next an Assistant Professor at Drexel University)
Dr. Forrest Lacey (Ph.D. 2016, next a Postdoc at NCAR)
Dr. Hyungmin Lee (Ph.D. 2016, next a Postdoc at Seoul National University)
Dr. Kristen Brown (Ph.D. 2016, next a Postdoc at US EPA)
Dr. Li Zhang (Postdoc 2012 - 2016, next a Research Scientist at NOAA)
Dr. Kateryna Lapina (Postdoc 2011 - 2015, co-advised with J. Milford)
Dr. Brian Meland (Postdoc 2011-2013, next at CU Denver)
Dr. Gill-Ran Jeong (Postdoc 2010-2012, next a Research Scientist at KIAPS)
Dr. Matthew Turner (Ph.D. 2015, next a Postdoc at NRL)
Dr. Juliet (Lye) Zhu (Ph.D. 2014, next a Postdoc at CSU)
Benjamin Worden-Sapper (Undergraduate researcher 2021-2023)
Colin Harkins (MS 2021, next a Research Associate at NOAA)
Ping Kang (visiting Ph.D. fellow from Wuhan University, 2014-2015)
Youfan Chen (visiting Ph.D. fellow from Peking University, 2018 - 2019)
Siyuan Shen (visiting undergraduate research fellow from Peking University, 2019)
Mohammad Alwakeel (Undergraduate researcher, 2019-2020)
Brigitte Rooney (Undergraduate researcher, Discovery Learning Apprentices, 2012-2013, next a graduate student at Caltech)
Carl Hussman (Scientific programmer 2013-2014)
Joseph Parks (Undergraduate researcher, 2012-2014)
Andre Perkins (BS, SOARS Protege, 2012-2013, next a graduate student at University of Washington)
Alexander J. Turner (Undergraduate researcher and Discovery Learning Apprentice 2010-2012, next a graduate student at Harvard University)
Steven Vogel (Undergraduate researcher 2012, next a graduate student at Stanford University)
Michael Seltzer (High school research intern 2013-2014, next an undergraduate student at Tufts University

Other

Shanon Reckinger, PhD Comprehensive Exam 2010, PhD Committee 2011
Dave Makhija, PhD Comprehensive Exam 2010, PhD Committee 2013
Christopher Lang, PhD Preliminary Exam 2010
Sebastian Kreissl, PhD Committee 2011
Ingrid Ulbrich, PhD Committee 2011
Carlos Hernan Villanueva, PhD Preliminary Exam 2012
Eric Brown-Dymkoski, MS Committee 2012, PhD Preliminary Exam 2013, PhD Comprehensive Exam 2014, PhD Committee 2016
Xiaoguang Xu, U. of Nebraska Lincoln, PhD Comprehensive Exam 2012, PhD Committee 2015
Berkeley Almand, PhD Preliminary Exam 2012, PhD Comprehensive Exam 2014
Mingjie Xie, PhD Comprehensive Exam 2012, PhD Committee 2013
Nick Clements, PhD Comprehensive Exam 2012, PhD Committee 2013
Ryan King, PhD Preliminary Exam 2013, PhD Comprehensive Exam 2015
Nurlybek Kasimov, PhD Comprehensive Exam 2014, PhD Committee 2016
Spencer Alexander, MS Committee 2014
Ji Peng, PhD Comprehensive Exam 2014, PhD Committee 2015
Birendra Adhikari, PhD Comprehensive Exam 2014, PhD Committee 2015
Scott Wieland, PhD Preliminary Exam 2014, PhD Comprehensive Exam 2017, PhD Committee 2017
Katherine Smith, PhD Preliminary Exam 2014
Collin J. Bezrouk, PhD Comprehensive Exam 2015, PhD Committee 2016
Irene Dedoussi, MIT, PhD Exam Proposal 2016, PhD Committee 2018

Luke Engvall, PhD Comprehensive Exam 2017, PhD Committee 2018
Rene Nsanzineza, PhD Comprehensive Exam 2017, PhD Committee 2018
Jason Christopher, PhD Comprehensive Exam 2017
Michaela Farr, Masters Thesis Committee 2017
Yi Wang, U. Iowa, PhD Comprehensive Exam 2018, PhD Committee 2019
Cheng Chen, U. Lille, PhD Committee 2018
Lie Li, U. Lille, PhD Committee 2018
Jake Thorson, MS Committee 2019
Parker Case, PhD Comprehensive Exam 2019, PhD Committee 2022
Olga Doronina, PhD Comprehensive Exam 2019, PhD Committee 2020
Nathan Malarich, PhD Comprehensive Exam 2020, PhD Committee 2020
Skyler Kern, PhD Preliminary Exam 2020, 2021, PhD Comprehensive Exam 2022, PhD Committee 2023
Corey Wetterer-Nelson, PhD Comprehensive Exam 2020, PhD Committee 2021
Xiaomeng Jin, Columbia University, PhD Committee 2020
Julian Quick, PhD Preliminary Exam 2020, PhD Comprehensive Exam 2021, PhD Committee 2021
Congmeng (Trammell) Lyu, Drexel University, PhD Proposal 2020, PhD Committee 2021
Sumit Sankhyan, PhD Preliminary Exam 2021, PhD Comprehensive Exam 2021, PhD Committee 2022
William Patterson, PhD Comprehensive Exam 2021
Xueying Xu, U. Minnesota, PhD Committee 2022
Mary McGuinn, PhD Preliminary Exam 2022, PhD Comprehensive Exam 2025, PhD Committee 2025
Helena Pliszka, MS Thesis Committee 2022
Zhendong Lu, U. Iowa, PhD Comprehensive Exam 2023
Lindsey Anderson, Chemistry, PhD Oral Exam 2023
Eli Miller, PhD Preliminary Exam 2023
Jennifer Miklaszewski, PhD Preliminary Exam 2023, PhD Comprehensive Exam 2024, PhD Committee 2024
Jothi Thondiraj, PhD Preliminary Exam 2024, MS Thesis Committee 2024
Ajeet Singh, PhD Preliminary Exam 2024
Remilekun Akinwonmi, MS Thesis Committee 2024
Forwood Wiser, Columbia University, PhD Committee 2025

Mentoring and Outreach

2019	Interview for National Academy of Science "Sciences Sessions" podcast series for PNAS, Feb 17.
2014	Supported Dr. Lapina's creation of two ozone gardens (one at NCAR, one on campus)
2014	Alicia Camacho, SOARS Protege, Research Mentee
2013-2014	Michael Seltzer, summer student, Research Mentee
2013	Judge, SOARS Protege Research Colloquium, NCAR, Aug 29
2012-2013	Andre Perkins, SOARS Protege, Research Mentee
2010	Raymond Detweiler, SOARS Protege, Writing Mentee
2009	Victoria Dorr, McNair Scholar, Research Mentee

Previous Research Grants

Observations, trends and health impacts for air quality in African urbanization hotspots $21,367, Patrick L. Kinney (PI), Henze (Co-PI).

- Columbia Univ. Earth Institute CCI; Robin DeJong (robin@ei.columbia.edu)
- 09/01/2008 – 09/01/2010
- Academic / summer / total months per year: 1/0/1

Inverse modeling and attainment analysis for improved decision support of $PM_{2.5}$ air quality regulations $1,201,007, Henze (PI), Patrick Kinney (Co-PI).
- NASA ROSES NNH08ZDA001N-Decisions; Lawrence Friedl (LFriedl@nasa.gov)
- 09/01/2009 – 08/30/2015
- Academic / summer / total months per year: 0/1/1

Regional effects of climate change on energy management and climate impact of potential changes in transportation sector emissions $279,000, Drew T. Shindell (PI), (Henze is Collaborator, nonfunded).
- NASA ROSES NNH08ZDA001N-Decisions; Lawrence Friedl (LFriedl@nasa.gov)
- 01/01/2009 – 12/31/2012
- Academic / summer / total months per year: 0.5/0/0.5

Further development, application, and evaluation of multi-phase adjoint sensitivity analysis for multidimensional air quality modeling $179,840, Amir Hakami (PI), (Henze is Consultant, $25,000).
- American Petroleum Institute; Dan Baker (dan.baker@shell.com)
- 10/01/2009 – 09/31/2011
- Academic / summer / total months per year: 0/0.5/0.5

Constraining ammonia emissions and $PM_{2.5}$ control efficiencies with a new combination of satellite data, surface observations and adjoint modeling techniques $249,942, Henze (PI).
- EPA STAR EPA-G2009-STAR-D2; Sherri Hunt (hunt.sherri@epa.gov)
- 01/05/2010 – 04/30/2014
- Academic / summer / total months per year: 0/1/1

Constraining local to global sources and distributions of tropospheric ammonia through model assimilation of satellite and in situ observations $485,162, Henze (PI).
- NASA ROSES NNH09ZDA001N-ACMA; D. Considine (David.B.Considine@nasa.gov)
- 03/17/2010 – 03/16/2015
- Academic / summer / total months per year: 0/1/1

Collaborative research: Quantifying the sensitivity of antarctic snowpack nitrate to primary NO_x sources and photodenitrification: Implications for the ice core record $443,640, Becky Alexander (PI), (Henze is Co-PI, $116,440).
- NSF ANT - OPP; Peter Milne (pmilne@nsf.gov)
- 05/01/2010 – 04/30/2012
- Academic / summer / total months per year: 0/1/1

Development of the CO/CO_2 adjoint for GEOS-Chem $59,665 Daven Henze (PI).
- NASA JPL; Gabriel Obregon (gabriel.obregon@jpl.nasa.gov)
- 03/08/2010 - 12/17/2010
- Academic / summer / total months per year: 0/2/2

Internalizing Environmental Damage Costs to Shape US Power System Development $35,000 Jana Milford (PI), Henze (Collaborator).
- RASEI Seed Grant; Carl A. Koval (koval@colorado.edu)
- 07/01/2010 – 06/30/2011
- Academic / summer / total months per year: 0/0/0

Constraining global estimates of aerosol direct radiative forcing and surface concentrations with APS data and the GEOS-Chem adjoint model $385,752 Henze (PI).
- NASA ROSES NNH09ZDA001N-GLORY; Hal Maring (hal.maring@nasa.gov)
- 11/01/2010 – 10/31/2014
- Academic / summer / total months per year: 0/1/1

Linking radiative forcing of fine-mode aerosols and tropospheric ozone to precursor emissions $328,650 Henze (PI).

- NASA ROSES NNH09ZDA001N-NIP; Ming-Ying Wei (Ming-Ying.Wei-1@nasa.gov)
- 08/06/2010 – 08/05/2014
- Academic / summer / total months per year: 1/1/2

Estimation and attribution of global CO2 surface fluxes using satellite observations of CO2 and CO from TES, GOSAT, and MOPITT $1,399,210 Dylan Jones (PI), (Henze is a Co-I, $57,942).

- NASA NNH09ZDA001N-ACOS; Kenneth Jucks (kenneth.w.jucks@nasa.gov)
- 09/02/2010 – 09/01/2015
- Academic / summer / total months per year: 0/1/1

Constraining urban-to-global scale estimates of black carbon distributions, sources, regional climate impacts, and co-benefit metrics with advanced coupled dynamic - chemical transport - adjoint models. $904,211 Greg Carmichael (PI) (Henze is a Co-PI, $512,892).

- EPA-G2010-STAR-L1; Bryan Bloomer (bloomer.bryan@epa.gov)
- 09/01/2011 – 08/31/2015
- Academic / summer / total months per year: 1/0/1

Source contributions to seasonal vegetative exposure to ozone $70,000 Daven Henze (PI), Jana Milford (Co-PI)

- NASA AQAST TT; John Haynes (jhaynes@nasa.gov)
- 09/01/2011 – 08/31/2012
- Academic / summer / total months per year: 0/0/0

The power of GEO-CAPE observations to constrain our understanding of ammonia fluxes $20,000 Daven Henze (PI).

- NASA GEO-CAPE Science Team; Jassim A. Al-Saadi (j.a.al-saadi@nasa.gov)
- 01/01/2012 – 12/31/2013
- Academic / summer / total months per year: 0/0/0

Source attribution of radiative forcing from short lived climate forcing agents $244,446 Daven Henze (PI).

- EPA-G2011-ORD-A1; James Davies (davies.james@epa.gov)
- 06/01/2012 – 05/31/2016
- Academic / summer / total months per year: 0.5/0/0.5

Continuation of the CMS Flux Pilot Project $1,542,900 Kevin Bowman (PI) (Henze is Co-I, $104,485).

- NASA CMS; Diane Wickland (Diane.E.Wickland@nasa.gov)
- 08/31/2012 – 02/28/2014
- Academic / summer / total months per year: 0/1/1

Collaborative Research: SNOWpack Photodenitrification from the Antarctic and Arctic Cryosphere (SNOW-PAAC) $197,689 Becky Alexander (PI) (Henze is a Co-PI, $57,151.

- NSF 11-532; Peter Milne (pmilne@nsf.gov)
- 06/01/2013 – 05/31/2015
- Academic / summer / total months per year: 0/1/1

Source contributions to reactive nitrogen in the US $69,915 Daven Henze (PI), Jana Milford (Co-PI)

- NASA AQAST TT; John Haynes (jhaynes@nasa.gov)
- 10/01/2011 – 09/30/2012
- Academic / summer / total months per year: 0/0/0

NASA AQAST Year 3 Tiger Teams $92,105 Daven Henze (PI)

- NASA AQAST TT; John Haynes (jhaynes@nasa.gov)
- 03/01/2014 – 02/28/2015
- Academic / summer / total months per year: 0/0/0

Optimal aggregation schemes for inversion of geostationary remote sensing observations $75,000 Daven Henze (PI).

- NASA GEO-CAPE Science Team; Jassim A. Al-Saadi (j.a.al-saadi@nasa.gov)
- 03/01/2016 – 12/31/2016
- Academic / summer / total months per year: 0.1/0/0.1

Using remote sensing and adjoint modeling for integration of climate impacts into design of ozone and aerosol control strategies $738,461 Henze (PI).

- NASA NNH09ZDA001N-AQAST; Lawrence Friedl (LFriedl@nasa.gov)
- 05/12/2011 – 05/11/2017
- Academic / summer / total months per year: 1/1/2

Optimal dimension reduction techniques for near-real time regional inversions of methane fluxes using WRF-DA and MCMC simulations $60,000 Daven Henze (PI).

- NASA GEO-CAPE Science Team; Jassim A. Al-Saadi (j.a.al-saadi@nasa.gov)
- 03/01/2017 – 12/31/2017
- Academic / summer / total months per year: 0.1/0/0.1

Sustainable Energy Pathways: A lab-to-market paradigm for the optimal design of sustainable energy storage materials $1,900,000 Sehee Lee (PI) (Henze is funded Collaborator).

- NSF SEP; Zeev Rosenzweign (zrosenzw@nsf.gov)
- 10/01/2012 – 09/30/2017
- Academic / summer / total months per year: 0/1/1

GEOS-Chem adjoint inversion of aerosol source emissions with multi-sensor (MODIS, MISR, and OMI) datasets over east Asia, and consequences for estimating aerosol direct radiative forcing and transboundary air pollution $466,002 Jun Wang (PI) (Henze is a Co-I, $127,280).

- NNH12ZDA001N-ACMAP; Richard S. Eckman (Richard.S.Eckman@nasa.gov)
- 07/15/2013 – 07/14/2017
- Academic / summer / total months per year: 0.1/0/0.1

Constraining US and global sources of nitrous oxide based on field observations and the GEOS-Chem adjoint model $412,359 Dylan Millet (PI) (Daven Henze is Co-PI, $76,999).

- NOAA-OAR-CPO-2013-2003445; Monika Kopacz (monika.kopacz@noaa.gov)
- 08/01/2013 – 07/31/2017
- Academic / summer / total months per year: 1/0/1

Sources, formation, and impacts of ammonium nitrate and ammonium sulfate aerosols: A modeling analysis constrained by surface, aircraft, and satellite data $453,637 Matthew J. Alvarado (PI) (Daven Henze is Co-PI, $76,999).

- NOAA-OAR-CPO-2013-2003445; Monika Kopacz (monika.kopacz@noaa.gov)
- 08/01/2013 – 07/31/2017
- Academic / summer / total months per year: 1/0/1

Inorganic aerosol precursor emissions during SENEX: A modeling analysis constrained by surface, aircraft and satellite data $392,884 Matthew J. Alvarado (PI) (Daven Henze is Co-PI, $82,507).

- NOAA-OAR-CPO-2014-2003692; Monika Kopacz (monika.kopacz@noaa.gov)
- 08/01/2014 – 07/31/2017
- Academic / summer / total months per year: 0.25/0/0.25

Source attribution of greenhouse gases in the Southeast at the interface of biogenic and anthropogenic emissions: multi-scale inverse modeling and uncertainty quantification $580,731 Daven Henze (PI).

- NOAA-OAR-CPO-2014-2003692; Monika Kopacz (monika.kopacz@noaa.gov)
- 08/01/2014 – 07/31/2017
- Academic / summer / total months per year: 0.25/0/0.25

CyberSEES: Type 2: Collaborative Research: Connecting Next-generation Air Pollution Exposure Measurements to Environmentally Sustainable Communities $845,936, Qin Lv (PI) (Daven Henze is Co-PI).

- NSF 14-531; Bruce K. Hamilton (bhamilto@nsf.gov)
- 09/01/2014 – 08/31/2018
- Academic / summer / total months per year: 0/0.35/0.35

Sensitivity analysis and recovery of dust emissions from spectral climate signals $539,721 Jun Wang (PI) (Daven Henze is Co-I, $216,451).

- NNH14ZDA001N-ACSCS; Hal Maring, hal.maring@nasa.gov
- 11/01/2014 – 10/31/2018 (one year NCE)
- Academic / summer / total months per year: 0/0.5/0.5

Supporting health impact assessment tools using remote sensing and earth system models - Tiger Team Supplement $100,000 Daven Henze (PI).

- NNH15ZDA001N-HAQST: John Haynes (jhaynes@nasa.gov)
- 07/01/2017 – 06/30/2018
- Academic / summer / total months per year: 0/0.25/0.25

High resolution atmospheric carbon cycle data assimilation $52,500 Daven Henze (PI).

- NASA JPL SURP; Kevin Bowman (kevin.bowman@nasa.gov)
- 10/01/2018 – 09/30/2019
- Academic / summer / total months per year: 0/0/0

Improving emissions, predictions and impact assessments of biomass burning smoke and dynamic air quality using FIREX observations, ground networks and satellite data $703,678 Daven Henze (PI).

- NOAA-OAR-CPO-2016-2004413; Monika Kopacz (monika.kopacz@noaa.gov)
- 07/01/2016 – 06/30/2021
- Academic / summer / total months per year: 1/0/1

Supporting health impact assessment tools using remote sensing and earth system models $348,143 Daven Henze (PI).

- NNH15ZDA001N-HAQST: John Haynes (jhaynes@nasa.gov)
- 08/11/2016 – 08/10/2021
- Academic / summer / total months per year: 0/1/1

Novel Use of NASA data with Emission Data Assimilation to Support U.S. National Air Quality Forecasting Capability and WMO Regional Chemical Reanalysis $367,145 Daniel Tong (PI) (Daven Henze Co-I, $43,606).

- NNH15ZDA001N-HAQST: John Haynes (jhaynes@nasa.gov)
- 08/11/2016 – 08/10/2021
- Academic / summer / total months per year: 0/1/1

Supporting health impact assessment tools using remote sensing and earth system models - Tiger Team Supplement 2 $350,782 Daven Henze (PI).

- NNH15ZDA001N-HAQST: John Haynes (jhaynes@nasa.gov)
- 09/01/2018 – 08/30/2021
- Academic / summer / total months per year: 0/0.29/0.29

Closing Methane Budget for the US Corn Belt $1,527,183 Dylan Millet (PI). (Daven Henze Co-I, $45,865)

- NASA NNH16ZDA001N-IDS, Hank Margolis (hank.a.margolis@nasa.gov)
- 5/15/2017 – 5/14/2020
- Academic / summer / total months per year: 0/0/0

Air quality and health impact assessment of transport sector air pollution $20,003, Daven Henze (PI)

- International Council on Clean Transportation; Josh Miller (josh@theicct.org)
- 03/01/2020 – 11/30/2020
- Academic / summer / total months per year: 0/0/0

Atmospheric Modelling in support of the GIZ - SEI collaboration on PMEH project "Integrated air quality management and climate change mitigation" $11,372, Daven Henze (PI)

- Stockholm Environmental Institute; Johan Kuylenstierna (johan.kuylenstierna@york.ac.uk)
- 07/15/2020 - 12/31/2020
- Academic / summer / total months per year: 0/0/0

Multi-phase inversion of aerosol sources using MODIS, MISR, OMI, and AERONET data and the GEOS-Chem adjoint. $809,486 Daven Henze (PI).

- NNH16ZDA001N-ACMAP: Kenneth Jucks (kenneth.w.jucks@nasa.gov)
- 02/17/2017 – 02/16/2022
- Academic / summer / total months per year: 0/1/1

Inverse modeling constraints on sources of NH_3 using CrIS remote sensing measurements $450,000, Daven Henze (PI).

- NNH17ZDA001N-TASNPP; Paula Bontempi (paula.bontempi@nasa.gov)
- 03/23/2018 – 03/22/2022
- Academic / summer / total months per year: 0/1/1

Methods and tools to integrate air quality and health into urban climate action planning $634,509 Susan Anenberg (Daven Henze is Co-I, $49,564).

- Wellcome Trust 2018 Climate Change and Health, ourplanetourhealth@wellcome.ac.uk
- 11/1/2019 – 10/30/2023
- Academic / summer / total months per year: 0/0.66/0.66

Surrogate modeling for atmospheric chemistry and data assimilation $770,775, Daven Henze (PI)

- NNH18ZDA001N-AIST; Michael Little (michael.m.little@nasa.gov)
- 01/16/2020 – 09/30/2023
- Academic / summer / total months per year: 0/1/1

Automated Model Reduction for Atmospheric Chemical Mechanisms $799,699, V. Faye McNeill (PI) (Henze is Co-I)

- EPA-G2019-STAR-C; Serena Chung (serena.chung@gov)
- 01/01/2020 – 12/31/2023
- Academic / summer / total months per year: 0/0.5/0.5

Using remote sensing and Earth system models to improve air quality and public health in megacities $1,048,738 Susan Anenberg (PI) (Daven Henze is institutional PI, $417,346).

- NNH17ZDA001N-HAQ; John Haynes (jhaynes@nasa.gov)
- 11/16/2018 – 06/14/2024
- Academic / summer / total months per year: 0/1/1

Improvements to the NASA CrIS NH3 product $494,465, Karen Cady-Pereira (PI) (Henze is Co-I, $58,522)

- NNH20ZDA001N-SNPPSP; Dr. Barry Lefer (barry.lefer@nasa.gov)
- 09/01/2023 – 12/31/2024
- Academic / summer / total months per year: 0/0.5/0.5 only in year 1

Automated Model Reduction for Atmospheric Chemical Mechanisms $799,699, V. Faye McNeill (PI) (Henze is Co-I)

- EPA-G2019-STAR-C; Serena Chung (serena.chung@gov)
- 01/01/2020 – 12/31/2024
- Academic / summer / total months per year: 0/0.5/0.5

Integrating Air Pollution Prediction Models: Uncertainty Quantification and Propagation in Health Studies $3,554,661, Marianthi Kioumourtzoglou (PI) (Henze is Co-I)

- NIEHS R01 ES030616; Dr. Bonnie Joubert (bonnie.joubert@nih.gov)
- 03/16/2020 –12/31/2024
- Academic / summer / total months per year: de minimus

Air quality impacts of shipping emissions $17,406, Henze (PI)

- ICCT, Bryan Comer, bryan.comer@theicct.org
- 06/20/2024 - 12/20/2024
- Academic / summer / total months per year: de minimus

Multi-sensor (OMI, OMPS, VIIRS, and TROPOMI) constraints and downscaling of NOx emissions in the continental U.S. during 2005-2018 and beyond $565,697 Jun Wang (Daven Henze is Co-I/Institutional PI, $236,485).

- NNH18ZDA001N; Richard Eckman (richard.s.eckman@nasa.gov)
- 04/30/2020 – 04/29/2025
- Academic / summer / total months per year: 0/1/1
- Primary place of performance: CU Boulder, CO, USA
- Potential overlap: none
- Objectives: Use satellite data from VIIRS, TROPOMI and OMI to better understand sector-specific emissions of NO_x.

Interpreting NASA airborne observations with the GEOS-Chem model in the context of complementary satellite and ground-based data for tracking changes in air quality $573,628, Randall Martin (PI) (Henze is Co-I, $180,000)

- NASA NNH20ZDA001N-ACCDAM; Dr. Richard Eckman (richard.s.eckman@nasa.gov)
- 04/01/2021 – 03/31/2025
- Academic / summer / total months per year: 0/0.5/0.5

GCHP adjoint for GHG flux inversions $101,035, Henze (PI)

- NASA JPL, Kevin Bowman (kevin.w.bowman@nasa.gov)
- 08/01/2024 - 09/24/2025
- Academic / summer / total months per year: 0/1.0/1.0

Active Research Grants

Enrich and Enhance the Application of TEMPO and GEOS Data Products for Regional Air Quality and Public Health Management Under Smoke Conditions Jun Wang $1,094,794, (PI) (Henze is Co-I, $191,608).

- NASA NNH21ZDA001N-HAQ; John Haynes (john.haynes@nasa.gov)
- 05/13/2022 – 05/12/2026
- Academic / summer / total months per year: 0/0/0; 0/0.25/0.25; 0/1/1

TEMPO NO2 data assimilation with an online Ensemble Kalman Filter for constraining US air pollutant emissions $225,000, Henze (PI)

- NASA NNH24ZDA001N-TEMPOACX
- 05/01/2025 - 04/30/2028
- Academic / summer / total months per year: 1.0/1.0/1.0

Constraining agricultural reactive nitrogen emissions using multi-modal data-driven approaches leveraging FarmFlux campaign and remote sensing observations $160,000, Henze (PI)

- NASA NNH24ZDA001N-FFST
- 05/01/2026 - 04/30/2029
- Academic / summer / total months per year: 0/0/0

Improving emissions estimation and mitigation for methane from landfills in Colorado $887,206, Michael Hannigan (PI)

- Colorado Department of Public Health and Environment
- 02/01/2026 - 01/31/2029
- Academic / summer / total months per year: 0/0.5/0.5

Air quality impacts of vehicle emissions $20,000, Henze (PI)

- ICCT, Lingzhi Jin, lingzhi.jin@theicct.org
- 10/01/2025 - 02/28/2026
- Academic / summer / total months per year: de minimus

[TERMINATED] Comprehensive top-down and bottom-up estimation of annual basin-wide methane emissions from the San Joaquin Valley (California) and Denver (Colorado) oil and gas basins using a multi-tiered measurement and analysis framework $2,999,000 Abhilash Vijayan (PI) (Co-I Daven Henze, $430,969)

- DE-FOA-0002616, grant DE-FE0032305; Maureen Davison (Maureen.Davison@netl.doe.gov)
- 09/01/2023 – 08/31/2026
- Academic / summer / total months per year: 0/1/1

[TERMINATED] Integrating measurements across platforms to feasibly assess emissions and mitigation of methane and VOCs from landfills $1,000,000, Mike Hannigan (PI) (Co-PI Daven Henze)

- EPA EPA-G2023-STAR-B1, grant 84062601; Flora Barrow (barrow.flora@epa.gov)
- 09/01/2023 – 08/31/2026
- Academic / summer / total months per year: 0/0.5/0.5

[TERMINATED] SAURON: Standoff Aerosol measUrement Remote Optical Network $18,696,153, Greg Rieker (PI) (Henze is Co-PI, $558,585)

- IARPA DOI-BAA-PICARD-FY23-01, grant 140D0423C0112; Sherrie Pilkington (sherrie.pilkington@iarpa.gov)
- 01/8/2024 – 01/7/2027
- Academic / summer / total months per year: 0/1.0/1.0

[TERMINATED] Federated Air Quality Modeling for Earth Digital Twins $4,158,675 Brosnan (PI) (Henze is Collaborator, $440,000)

- NASA NNH23ZDA001N-AIST
- 1/1/2025 – 12/31/2027
- Academic / summer / total months per year: de minimus

Recent (2016 - 2026) Invited Seminars

2026 **Henze, D. K.**, C.-H. Hsu, A. Mizzi, O. Cooper, B. McDonald, Joint Assimilation of NO_2 and HCHO Observations from TEMPO and TROPOMI for Constraining NO_x and VOC Emissions, American Meteorological Society, Air Quality Insights from Satellite Retrievals, 7B.3, Houston, January 25 - 29.

2025 **Henze, D. K.**, O. Nawaz, P. Wiecko, J. Choi, Y. Gu, High-resolution estimates of source contributions to $PM_{2.5}$, O_3, and NO_2 health burdens worldwide, American Geophysical Union, GH43A-02, New Orleans, Dec 15 - 19.

2025 **Henze, D. K.**, O. Nawaz, P. Wiecko, Masayuki Takeuchi, Greg Rieker, Probing air pollution from a distance: Remote sensing-based estimates of atmospheric composition, pollution exposure, and policy impacts on air quality, Georgia Institute of Technology, Nov 3.

2025 **Henze, D. K.**, J. Zhu, H. Cao, C. Francoeur, B. McDonald, Satellite-based estimates of ammonia and ethane emissions, Air and Waste Management Association, webinar, May 6.

2025 **Henze, D. K.**, Z. Qu, Sector-based estimates of NO_x, SO_2 and CO emissions in East Asia, MOPITT 25th Anniversary Meeting, Canadian Space Agency, Montreal, April 10 - 11.

2024 **Henze, D. K.** Two decades of tracking down sources of NH_3, John Seinfeld Symposium, Caltech, Pasadena, Sep 27-28.

2024 **Henze, D. K.**, B. Worden-Sapper, X. Yu, N. Bousserez, Dimensions and definitions of emissions scaling factors for regional gridded atmospheric inversions, Methane Inverse Modeling Technical Workshop, EPA, Research Triangle Park, July 19 - 20.

2024 **Henze, D. K.**, C.-H. Hsu, A. Mizzi, B., McDonald, W. Thongsame, H. Cao, Chemical data assimilation of geostationary trace-gas satellite observations, GeoXO Science Team, NOAA, College Park, March 7 - 9.

2024 **Henze, D. K.**, Regional to global air quality modeling, Community of Practice for Air Pollution in Denver, Denver, June 17.

2023 **Henze, D. K.**, B. Worden-Sapper, X. Yu, N. Bousserez, Zhen Qu, Mathematics of chemical data assimilation and inverse modeling, Atmospheric Constituents Data Assimilation and Inverse Modeling Workshop, Banff, March 19-24.

2023 **Henze, D. K.**, M. O. Nawaz, S. C. Anenberg, C. W. Tessum, Regional vs local sources of municipal air pollution-related health impacts, American Meteorological Society, Regional Air Quality, Denver, Jan 8 - 12.

2022 **Henze, D. K.**, H. Cao, J. Choi, C.-H. Hsu, Z. Qu, X. Che, J. Wang, A. Mizzi, B. McDonald, Top-down constraints on emissions using satellite observations, NOAA Modeling Board, Enabling Observations into Models Working Group, virtual, Nov 4.

2022 **Henze, D. K.**, H. Cao, K. Cady-Pereira, Trends in NH_3 concentrations from satellite remote sensing measurements, Rocky Mountain National Park Agriculture Subcommittee, virtual, May 20 and Nov 3.

2022 **Henze, D. K.**, M. O. Nawaz, H. Cao, Sources and human health impacts of air pollution constrained using remote sensing data and air quality modeling, NOAA Chemical Sciences Laboratory, Boulder, Oct 5.

2022 **Henze, D. K.**, M. O. Nawaz, H. Cao, Air quality modeling for integrated health assessments, Workshop on Atmospheric Transport and Economic Valuation of Air Pollution, Mannheim, Germany, July 6-7, *Keynote*.

2022 **Henze, D. K.**, M. O. Nawaz, H. Cao, Atmospheric modeling and satellite data analysis for air quality research and applications, Colorado Regional Air Quality Council, virtual, June 15.

2022 **Henze, D. K.**, H. Cao, J. Choi, C.H. Hsu, Z. Qu, X. Che, J. Wang, A. Mizzi, B. McDonald, Constraining emissions of NOx and VOCs using LEO and GEO remote sensing measurements and data assimilation / inverse modeling systems, TEMPO Science Team, virtual, May 25.

2022 **Henze, D. K.**, H. Cao, K. Cady-Pereira, J. Zhu, H. Lee, Nitrogen deposition sources and satellite-based estimates of NH_3 emissions, Rocky Mountain National Park Agriculture Subcommittee, virtual, Feb 23.

2021 **Henze, D. K.**, W. Tsui, J. Choi, Hee-Sun Choi, Alireza Doostan, A. Hodzic, D. Gagne, J. Schreck. S. Rowland, M.-A. Kioumourtzglou, F. Wiser, V. F. McNeill, Reduction of large datasets and expensive air quality model calculations through statistical analysis and machine learning, International Aerosol Modeling and Algorithms (IAMA), hosted virtually, Dec 9, **Keynote**.

2021 **Henze, D. K.**, O. Nawaz, C. Lyu, S. Capps, Observationally constrained source attribution modeling of air pollution health impacts, Meteorology and Climate - Modeling for Air Quality (MAC-MAQ), hosted virtually, Sep 16.

2021 **Henze, D. K.**, Estimating the health impact from air pollution: An overview of modeling tools, Health Effects Institute webinar, hosted virtually, April 20.

2020 **Henze, D. K.**, H. Cao , K. Cady-Pereira, C. Lonsdale, M. Alvarado, M. Shephard, E. Dammers, G. Luo, F. Yu, L. Zhu, C. Danielson, E. Edgerton, J.J. Guerrette, N. Bousserez, Satellite-based constraints on aerosol, aerosol precursor, and GHG emissions: applications and new inverse modeling techniques, Harvard University, Cambridge, MA, March 6.

2019 **Henze, D. K.**, H. Cao, M. Omar Nawaz, C. Malley, Evaluation and application of remote sensing and air quality modeling for international health and climate assessment studies, European Commission Joint Research Centre, Ispra, Italy, Oct 3.

2019 **Henze, D. K**, Z. Qu, H. Cao, J. J. Guerrette, N. Bousserez, L. Zhang, Satellite-based constraints on aerosol, ozone, and GHG precursors emissions: applications and new inverse modeling techniques, University of Helsinki, Department of Physics, Helsinki, Finland, Aug 22.

2019 **Henze, D. K.**, C. Lee, A. von Donkelaar, R. Martin, F. Lacey, S. Anenberg, C. Malley, H. Zhao, Using models and remote sensing to estimate global health impacts of air pollution, Frontiers of Atmospheric Science and Chemistry: Integration of Novel Applications and Technological Endeavors (FASCINATE), Boulder, CO, Sep 9 - 12.

2019 **Henze, D. K.**, Z. Qu, H. Cao, Z. Jiang, Top-down constraints on emissions of NO2, SO2 and NH3, NASA Health and Air Quality Applied Sciences Team Meeting 6, Pasadena, CA, Jul 10 - 12.

2019 **Henze, D. K.**, Z. Qu, J. Milford, K. Brown, S. Anenberg, P. Achakulwisut, M. Brauer, D. Moran, J. S. Apte, Mortality from particulate matter in cities worldwide: a challenge and an opportunity for co-benefits from low carbon development, 15th Meeting of the Atmospheric Composition Virtual Constellation (NASA CEOS AC-VC), Tokyo, Japan, Jun 10-12.

2019 Qu, Z., **D. K. Henze**, 4D-Var NOx emission constraints and the potential of future high-resolution geo-stationary observations, TEMPO Science Team Meeting, Madison, WI, June 7.

2019 **Henze, D. K.**, F. Lacey, H. Cao, K. Brown, J. Milford, M. Omar Nawaz, Application of remote sensing and air quality models for constraining sources and impacts of air quality and greenhouse gas emissions, Johns Hopkins University, Department of Environmental Health and Engineering, Baltimore, MD, Apr 30.

2019 **Henze, D. K.**, F. Lacey, H. Cao, K. Brown, J. Milford, M. Omar Nawaz, Evaluation and application of remote sensing and air quality modeling for international health and climate assessment studies, Department of Mechanical Engineering, University of California Riverside, Apr 19.

2019 **Henze, D. K.**, C. Malley, J. C. I. Kuylenstierna, R. W. Pinder, S. Terry, H. Vallack, C. Heaps, E. Lefevre, S. Anenberg, S. Penn, A. CurryBrown, N. Fann, J. Neumann, H. Roman, K. Hicks, Y. Davila, E. Marais, F. Lacey, O. Nawaz, J. Choi, H. Lee, Air quality and climate assessment tools and analyses to inform policy, American Association for the Advancement of Science (AAAS) 185th Annual Meeting, Panel Member for Transboundary Air Pollution: The Impact of Science on Policy, Washington D.C., Feb 16.

2019 **Henze, D. K.**, C. Malley, J. C. I. Kuylenstierna, R. W. Pinder, S. Terry, H. Vallack, C. Heaps, E. Lefevre, S. Anenberg, S. Penn, A. CurryBrown, N. Fann, J. Neumann, H. Roman, K. Hicks, Y. Davila, E. Marais, F. Lacey, P. Kinney, Use of satellite-informed PM2.5 concentrations in an international integrated assessment tool (LEAP-IBC), NASA Health and Air Quality Applied Sciences Team Meeting 5, Phoenix, AZ, Jan 3 - 4.

2018 **Henze, D. K.**, C. Malley, J. C. I. Kuylenstierna, R. W. Pinder, S. Terry, H. Vallack, C. Heaps, E. Lefevre, S. Anenberg, S. Penn, A. CurryBrown, N. Fann, J. Neumann, H. Roman, K. Hicks, Y. Davila, E. Marais, F. Lacey, A33F-01: Linking global-scale and urban-scale integrated assessment tools, AGU Fall Meeting, Washington D.C., Dec. 10 – 14.

2018 Worden, H., Z. Jiang, B. McDonald, J. R. Worden, K. Miyazaki, Z. Qu, **D. K. Henze**, D. B. A. Jones, A. Arellano, E. Fischer, L. Zhu, F. Boersma, D. Jacob, R. S.Silvern, A31B-02: Unexpected slowdown of US pollutant emission reduction in the past decade, AGU Fall Meeting, Washington D.C., Dec. 10 – 14.

2018 Bowman, K., N. Bousserez, J. Liu, M. Lee, **D. K. Henze**, A21A-03: Resolving the information in large-scale inversions: application to CMS-Flux, AGU Fall Meeting, Washington D.C., Dec. 10 – 14.

2018 **Henze, D. K.** and C. Shim, NMVOCs and NH3 top-down emissions using 4-D VAR adjoint modeling The First Workshop for the Development of Korean Air Quality Forecasting System, Busan, Korea, Nov 8 – 10.

2018 **Henze, D. K.**, H. Cao, J. Choi, H. M. Lee, Z. Qu, R. Park, Satellite remote-sensing constraints on O3 precursor emissions in East Asia, The First Workshop for the Development of Korean Air Quality Forecasting System, Busan, Korea, Nov 8 – 10.

2018 **Henze, D. K.**, H. M. Lee, J. Choi, R. Park, Sources of $PM_{2.5}$ during pollution events in Korea, Air Pollution Extremes Workshop, Columbia University, Nov 1 – 2.

2018 **Henze, D. K.**, Jiang, Z., McDonald, B. C., H. Worden, J. R. Worden, K. Miyazaki, Z. Qu, D. B. A. Jones, A. F. Arellano, E. V. Fischer, L. Zhu, K. F. Boersma, Slowing Declines in U.S. NOx Emissions Reductions Detected With OMI, EPRI webinar, Sep 11.

2018 **Henze, D. K.**, J. Wang, and Y. Davila, GEOS-Chem adjoint model and data assimilation working group, NCAR, Boulder, July 30.

2018 **Henze, D. K.**, Jiang, Z., McDonald, B. C., H. Worden, J. R. Worden, K. Miyazaki, Z. Qu, D. B. A. Jones, A. F. Arellano, E. V. Fischer, L. Zhu, K. F. Boersma, Slowing Declines in U.S. NOx Emissions Reductions Detected With OMI, NASA Health and Air Quality Applied Sciences Team Meeting 4, July 16 – 17.

2018 **Henze, D. K.**, N. Bousserez, and J. J. Guerrette, Randomized Incremental Optimal Technique (RIOT) for large-scale Bayesian atmospheric inversions and data assimilation, Asia Oceana Geosciences Society, Honolulu, HI, June 4 – 8.

2018 **Henze, D. K.**, International air quality, health, and climate impacts of cookstoves, diesel NOx, and recent updates to ozone health impacts, CU Boulder, Department of Chemistry, Mar 5.

2018 **Henze, D. K.**, N. Bousserez, and J. J. Guerrette, Error estimation, dimension reduction, and the Randomized Incremental Optimal Technique (RIOT) for large-scale Bayesian atmospheric inversions and data assimilation, NASA GMAO, Greenbelt, MD, Feb 27.

2017 **Henze, D. K.**, N. Bousserez, and J. J. Guerrette, Dimension reduction, error estimation, and the Randomized Incremental Optimal Technique (RIOT) for large-scale Bayesian atmospheric inversions and data assimilation, Korean Society for Atmospheric Environment, Daegu, Korea, Nov 8 – 9.

2017 **Henze, D. K.** International air quality, health, and climate impacts of cookstoves, diesel NOx, and other anthropogenic sectors via PM2.5 and O3, NCAR ACOM, Boulder CO, Oct 2.

2017 **Henze, D. K.** and A. Fiore, Overview of current evaluations, applications and advances in global air quality models, Western Regional Air Quality Modeling, NCAR, Boulder, CO, Sep 6 – 8.

2017 **Henze, D. K.**, Top-down constraints on NH_3 emissions, EPA Emissions Webinar Series, June 19.

2017 **Henze, D. K.**, NASA Health and Air Quality Applied Sciences Team, ICESat-2, Boulder, CO, May 31 – June 2.

2017 **Henze, D. K.** International air quality, health, and climate impacts of cookstoves, diesel NOx, and other anthropogenic sectors via PM2.5 and O3, EHS, Columbia University, New York City, NY, May 18.

2017 **Henze, D. K.** The GEOS-Chem adjoint model, IGC8, Harvard University, Cambridge, MA, May 1 – 4.

2017 **Henze, D. K.** Remote sensing constraints on aerosol and greenhouse gas emissions, BPE Lecture Series, Columbia University, New York City, NY, April 21.

2017 **Henze, D. K.** Dimension reduction, error estimation, and the Randomized Incremental Optimal Technique (RIOT) for large-scale Bayesian atmospheric inversions and data assimilation, SCiCS Lecture Series, Columbia University, New York City, NY, April 20.

2017 **Henze, D. K.** International air quality, health, and climate impacts of cookstoves, diesel NOx, and recent updates to ozone health impacts, Climate Center Lecture Series, Columbia University, New York City, NY, April 19.

2017 **Henze, D. K.** International air quality and climate impacts of emissions control strategies for cookstoves and diesel NOx, G&G AOCD, Yale University, New Haven, CT, March 30.

2017 **Henze, D. K.** and N. Bousserez, A. Doostan, and J. J. Guerrette, Algorithm needs for addressing chemical data assimilation and source inversion, NSF, Unified Data Assimilation, Alexandria, VA, April 5.

2017 **Henze, D. K.**, Adjoint and perturbation estimates of PM2.5 and O3 source-receptor relationships, HTAP, EPA, RTP, NC, April 3.

2017 **Henze, D. K.**, Climate and health impacts of cookstoves: Evaluation with satellite-data, modeling, and source attribution, HAQAST 2, Seattle, WA, Feb 28.

2016 **Henze, D. K.**, Evaluating international air quality, climate, and ecosystem impacts of control strategies using remote sensing and adjoint modeling – case studies on cookstoves and diesel NOx emissions, SIPA, Columbia University, New York City, NY, Oct 10.

2016 **Henze, D. K.**, Adjoint modelling, International Summer School on Atmospheric and Oceanic Sciences (ISSAOS), Advanced Programming Techniques for the Earth System Science, Gran Sasso Science Institute, August 28 – September 2, L'Aquila, Italy.

2016 **Henze, D. K.**, How scientific and technical air quality modeling tools interact with policy, Advances in Air Quality Analysis and Prediction: The Interaction of Science and Policy, NCAR ASP Summer Colloquium, Boulder, CO, July 25 – Aug 5.

2016 **Henze, D. K.**, Inverse problems and parameter (emissions) estimation, Advances in Air Quality Analysis and Prediction: The Interaction of Science and Policy, NCAR ASP Summer Colloquium, Boulder, CO, July 25 – Aug 5.

2016 **Henze, D. K.**, Current and future impacts of long-range transport on vegetative ozone exposure in the U.S., Telluride Gas Phase Atmospheric Chemistry Meeting, July 18 – 22.

2016 **Henze, D. K.**, Constraining sources of air pollution using air quality adjoint models and remote sensing observations, Department of Chemical Engineering, Columbia University, New York City, NY, March 22.

2016 **Henze, D. K.**, Constraining sources of air pollution using air quality adjoint models and remote sensing observations, NCAR Advance Studies Program, Boulder, CO, April 26.

2016 **Henze, D. K.**, and N. Bousserez, Preparing an air quality assimilation system for operational requirements and next generation measurement technologies, Blueprints for Next Generation Data Assimilation Systems Convened jointly by the NCAR DA Program and the JCSDA, Boulder, CO, March 8 – 10.

Peer Review of Journals and Proposals

Advances in Meteorology: 2016 (1)
Aerosol Science and Technology: 2017 (1), 2011 (2), 2009 (1), 2006 (1)
Aerosol and Air Quality Research: 2016 (1)
Air Quality, Atmosphere, and Health: 2024 (1)
Asia-Pacific Journal of Atmospheric Sciences: 2012 (2)
Atmosphere: 2011 (2)
Atmospheric Chemistry and Physics: 2023(1), 2022 (2), 2021 (1), 2020 (3), 2019 (8), 2018 (7), 2017 (8), 2016 (3), 2015 (5), 2014 (6), 2013 (10), 2012 (5), 2011 (8), 2010 (4), 2009 (2), 2008 (4), 2006 (1)
ACS Earth and Space Chemistry: 2021 (1)
Atmospheric Environment: 2024 (1), 2020(1), 2016 (1), 2015 (4), 2012 (4), 2011 (3), 2010 (2), 2009 (3), 2008 (1), 2006 (1)
Atmospheric Measurement Technology: 2023 (3)
Atmospheric Research: 2017 (1), 2016 (1)
Climate Change: 2011 (1)
Communications Earth & Environment: 2022
Computers & Geosciences: 2011 (2)
Earth System Dynamics: 2017
Earth System Science Data: 2024
Elementa: 2021 (1), 2020 (1)
Environment International: 2016 (3)
Environmental Pollution: 2021(1), 2017 (1), 2016 (1)
Environmental Research Communications: 2022 (1)
Environmental Research Letters: 2021 (1), 2020 (1), 2019 (2), 2017 (2), 2016 (5), 2015 (2)
Environmental Science and Technology: 2023 (1), 2022 (2), 2021 (1), 2020 (2), 2019 (5), 2018 (1), 2017 (3), 2016 (3), 2015(3), 2014 (1), 2013 (1), 2012 (2), 2011 (2), 2010 (3), 2009 (1), 2006 (1)
Environmental Science and Technology Air: 2024 (3), 2023 (3)
Environmental Science and Technology Letters: 2022 (1), 2018 (1)
Geoscientific Model Development: 2025, 2023 (2), 2020 (2), 2019 (1) 2018 (1), 2017 (1), 2016 (1), 2015 (1), 2014

(2), 2013 (1), 2010 (1), 2009 (2)
Geophysical Research Letters: 2024 (2), 2023 (1), 2020 (1), 2018 (2), 2017 (1), 2016 (2), 2013 (1), 2010 (1)
Global Biogeochemical Cycles: 2011 (1)
International Journal of Climatology: 2010 (1), 2009 (1)
Inverse Problems: 2018 (1)
Journal of Advances in Modeling Earth Systems: 2013 (2)
Journal of Aerosol Science: 2008 (1), 2007 (1)
Journal of Exposure Science And Environmental Epidemiology: 2019 (1)
Journal of Geophysical Research: 2025 (1), 2019 (1), 2018 (4), 2016 (4), 2015 (4), 2014 (4), 2013 (3), 2012 (2), 2011 (3), 2010 (6), 2009 (2), 2008 (2), 2006 (2), 2005 (2), 2004 (2)
Nature: 2018 (1)
Nature Communications: 2023 (1), 2022 (3), 2021 (2)
Nature Sustainability: 2025(1)
PLOS Medicine: 2018 (2)
PNAS: 2021(2), 2020 (1), 2018 (1), 2013 (1)
QJRMS: 2013 (1)
Remote Sensing: 2013 (2)
Remote Sensing of Environment: 2015 (2)
Science: 2025, 2015 (1), 2009 (1), 2006 (1)
Science Advances: 2021 (2), 2015 (1), 2009 (1), 2006 (1)
Science of the Total Environment: 2019 (1), 2009 (1)
Scientific Reports: 2019 (1), 2017 (1)
The Lancet Planetary Health: 2025 (1), 2023 (2), 2021 (4)

CARA: 2016 (1)
CORE: 2013 (2)
CU Seed Grant Panel: 2011 (1)
DOE SCGSR: 2020 (1),
Dutch Research Council Proposal Review: 2019 (1)
Finland National Academy: 2021 (1)
NASA Review Panel: 2022 (1), 2021 (1), 2013 (1), 2012 (2), 2011 (1), 2010 (1)
NERC Proposal Review: 2013 (1)
Netherlands Space Office (NSO): 2011 (1)
NSF Proposal Review: 2021 (1), 2017 (1), 2014 (1), 2011 (1), 2010 (1)
NOAA Proposal Review: 2023 (9), 2020 (4), 2019 (2), 2016 (1), 2011 (1), 2010 (1)
NWO Veni Proposal Review: 2020 (1), 2019 (1)