

Daniel M. Westervelt, PhD

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Research and Teaching Interests

Air quality, climate change, atmospheric chemistry, surface observations, global atmospheric modeling, particulate matter, aerosol-climate interactions, aerosol health effects, environmental engineering and science

Education

- Ph.D. Civil and Environmental Engineering. Carnegie Mellon University. Pittsburgh, PA. May 2013 Advisor: Peter Adams
- M.S. Civil and Environmental Engineering. Carnegie Mellon University, Pittsburgh, PA. May 2009
- B.S. Civil Engineering. Purdue University. West Lafayette, IN. May 2008.

Funded research grants

National Science Foundation. “Collaborative Research: Accelnet: Clean Air Monitoring and Solutions Network”. \$2,000,000. Lead PI. 1/1/21 – 1/1/26

Department of State, USA. “Capacity building, knowledge sharing, and air quality improvement for Anglophone and Francophone West Africa”. \$440,440 PI. 10/1/2021 – 10/1/2024

Department of State, USA. “International networking, knowledge sharing, and capacity building for improved air quality in four East African countries”. \$300,000 Lead PI. 10/1/20 – 10/1/2023

Columbia University Data Science Institute. “Application of Gaussian Mixture Regression to Obtain Useful, Actionable Air Pollution Data from Consumer-Grade, Low-Cost Monitoring Devices” 2/1/2022 – 1/31/2024. \$150,000. Lead PI

US Agency for International Development. “Catalyzing Clean Air.” \$800,000 subaward to Columbia via World Resources Institute. Co-PI. 10/1/20 – 10/1/25

Columbia University Provost’s Office. “Towards closing the air pollution data gap in sub-Saharan Africa through international collaboration and capacity building.” \$42,000. 7/1/2020 – 6/31/2022. Lead PI

Environmental Protection Agency. “Automated Model Reduction for Atmospheric Chemical Mechanisms”. \$462,025 Co-I. 12/1/2020 – 11/30/2023.

Columbia University Data Science Institute. “Detecting and attributing spatiotemporal variations in sources of ground-level air pollution with a modeling testbed for integrating multiple noisy satellite datasets.” 1/1/2020 – 12/31/2021. \$200,000. Co-PI.

National Institute of Health (NIH) U2R. Advancing Public Health Research in Eastern Africa through Data Science Training (APHREA-DST). 09/01/2021 - 08/31/2026. co-I. \$50,000. (Lead: Kiros Berhane CU MSPH)

Columbia University Earth Institute. 12/1/2019 – 12/31/2020 “Clean air toolbox for cities initiative”. \$150,000. co PI

Columbia Center for Climate and Life. 7/1/2019 – 12/31/2022. “Towards the development of a real-time air pollution monitoring network in sub-Saharan Africa”. \$201,328. Lead PI

Lamont Center for Climate and Life. “The Impact of Rapidly Changing Regional Aerosol Emissions on Near-term Climate.” \$119,926. 12/1/22 – 12/1/25

Industrial Economics, Inc. 2/1/2020 – 12/31/2020. “Data analysis of low cost air pollution monitors in a polluted neighborhood in Accra, Ghana”. \$20,000. Subcontract, Institutional PI.

Lamont-Doherty Earth Observatory, Columbia University. Columbia Climate Center. 2/1/2019-1/31/2021. “Development of an air pollution monitoring network in the megacity of Kinshasa, Democratic Republic of the Congo”. \$10,000. Lead PI

National Science Foundation, Atmospheric and Geospace Science (AGS). \$169,504. 9/1/18 – 9/31/20. “Local and Remote Regional Climate Responses to Regional Forcings from Short-Lived Climate Forcers”. Co-I

National Science Foundation. Atmospheric and Geospace Science (AGS). \$602,918. 11/1/16 – 10/31/20 “Understanding Forced and Natural Asian Monsoon Variability and Change in Observations and CMIP5 Models.” Co-PI

NASA Atmospheric Chemistry, Modeling, Analysis and Prediction (ACMAP). \$748,955. 1/1/17 – 12/31/20. “Variability and trends in tropospheric oxidation: Interactions with regional air quality, global atmospheric composition, and climate”. Co-PI

Columbia University Global Policy Center. \$200,000. 6/1/16 – 5/31/18. “Assessing future Chinese air pollution impacts on mortality in China and the U.S.” Co-PI

Columbia University Earth Institute. \$15,000. 9/1/2015 – 12/19/2016. “Can satellite observations help us better understand the air quality problem in India?” Lead PI

(Pending) Department of Energy E3SM opportunity “Improved Understanding of the Near-Term Hydrological Impacts of Regional Aerosols”. \$60,000 co-I (UC-Riverside Lead)

(Pending) National Institutes of Health Policy R01 “Are urban policies to reduce car dependency equitable? An interdisciplinary framework to assess impacts on pollution, neighborhoods, and adverse health outcomes”. \$50,000 co-I (Columbia MSPH lead)

(Pending) NASA. Leveraging NASA Earth Observations and machine learning to understand air pollution and health disparities across West Africa. Lead PI. \$1,000,000

Experience

Lamont Assistant Research Professor (primary appointment) Columbia University, Lamont-Doherty Earth Observatory	7/2021 – present
Affiliate Faculty Columbia University Data Science Institute	2/2021 - present
Science Collaborator NASA Goddard Institute for Space Studies (NASA GISS)	9/2016 - present
Associate Research Scientist Columbia University, Lamont-Doherty Earth Observatory	8/2015 – 6/2021
Postdoctoral Research Associate in Science, Technology, and Environmental Policy Princeton University and Geophysical Fluid Dynamics Lab (GFDL) Advisor: Denise Mauzerall	8/2013 – 8/2015

Peer-reviewed Publications (** indicates student or postdoc advisee)

Raheja, Garima**, James Nimo, Emmanuel K.-E. Appoh, Benjamin Essien, Maxwell Sunu, John Nyante, Mawuli Amegah, Reginald Quansah, Raphael E Arku, Stefani L. Penn, Michael R. Giordano, Zhonghua Zheng, Darby Jack, Steven Chillrud, Kofi Amegah, R Subramanian, Rob Pinder, Ebenezer Appah-Sampong, Esi Nerquaye Tetteh, Mathias A. Borketey, Allison Felix Hughes, **Daniel M. Westervelt**. “Low-Cost Sensor Performance Intercomparison, Correction Factor Development, and 2+ Years of Ambient PM_{2.5} monitoring in Accra, Ghana.” Accepted to *Environmental Science and Technology*, March 2023

G. Persad, B. H. Samset, L. J. Wilcox, Robert J. Allen, Massimo A. Bollasina, Ben B. Booth Celine Bonfils, Manoj Joshi, Marianne T. Lund, Kate Marvel, Joonas Merikanto, Kalle Nordling, Sabine Undorf, Detlef van Vuuren, **Daniel M. Westervelt**, Alcide Zhao. “Rapidly evolving aerosol emissions are a dangerous blind spot in near-term climate risk.” Submitted to *Environmental Research: Climate*, October 2022.

Wilcox, L. J., Allen, R. J., Samset, B. H., Bollasina, M. A., Griffiths, P. T., Keeble, J. M., Lund, M. T., Makkonen, R., Merikanto, J., O'Donnell, D., Paynter, D. J., Persad, G. G., Rumbold, S. T., Takemura, T., Tsigaridis, K., Undorf, S., and **Westervelt, D. M.**: The Regional Aerosol Model Intercomparison Project (RAMIP), *Geosci. Model Dev. Discuss.* [preprint], <https://doi.org/10.5194/gmd-2022-249>, in review, 2022.

Forwood C. Wiser, Bryan Place, Siddhartha Sen, Havala O. T. Pye, Benjamin Yang, **Daniel M. Westervelt**, Daven K. Henze, Arlene M. Fiore, and V. Faye McNeill. “AMORE-Isoprene v1.0: A new reduced mechanism for gas-phase isoprene oxidation”. Accepted at Geophysical Model Development Discussions. 2023 (in press)

Singh, D., Singh, J., You, Y., Smith, S., **Westervelt, D.M.**, and Ting, M. “Impact of aerosol reductions on Asian Monsoon rainfall extremes: Insights from the record wet 2020 season”. Submitted to Geophysical Research Letters, 2022.

Baublitz, C., Fiore, A.M., ..., **Westervelt, D.M.** ... Wofsy, S.C et al. Regional oxidation in the remote atmosphere explained by an observation-based reduced-form model. In review at PNAS, 2023

Zheng, Z.**, Fiore, A.M, **Westervelt, D.M.**, et al. "Automated machine learning to evaluate the information content of tropospheric trace gas columns for fine particle estimates over India: a modeling testbed". Accepted at JAMES, 2023.

Sebastian, M., Kompalli, S. K., Kumar, V. A., Jose, S., Babu, S. S., Pandithurai, G., Singh, S., Hooda, R. K., Soni, V. K., Pierce, J. R., Vakkari, V., Asmi, E., **Westervelt, D. M.**, Hyvärinen, A.-P., and Kanawade, V. P.: Observations of particle number size distributions and new particle formation in six Indian locations , Atmos. Chem. Phys., 22, 4491–4508, <https://doi.org/10.5194/acp-22-4491-2022>, 2022.

Raheja, Garima**, Sabi, Kokou, Hèzouwè, Sonla, Gbedjangni, Eric Kokou, McFarlane, Celeste M., Holdoli, Collins Gameli, and **Westervelt, D.M.** “A network of field-calibrated low-cost sensor measurements of PM2.5 in Lomé, Togo, over one to two years.” ACS Earth and Space chemistry,6,4, 1011-1021, <https://doi.org/10.1021/acsearthspacechem.1c00391>, 2022.

Raheja, Garima**.; Harper, L.; Hoffman, A.; Gorby, Y.; Freese, L.; O’Leary, B.; Deron, N.; Smith, S.; Auch, T.; Goodwin, M.; **Westervelt, D. M.** Community-Based Participatory Research for Low-Cost Air Pollution Monitoring in the Wake of Unconventional Oil and Gas Development in the Ohio River Valley: Empowering Impacted Residents through Community Science. Environ. Res. Lett. 2022, 17 (6), 065006. <https://doi.org/10.1088/1748-9326/ac6ad6>. 2022

Yang, H., Huang, X., **Westervelt, D.M.**, Horowitz, L.W. and Peng, W. "Socio-demographic factors shaping the future global health burden from air pollution". Nat Sustain (2022). <https://doi.org/10.1038/s41893-022-00978-6>

Karambelas, A., Fiore, A. M., **Westervelt, D. M.**, McNeill, V. F., Randles, C. A., Venkataraman, C., et al. (2022). Investigating drivers of particulate matter pollution over India and the implications for radiative forcing with GEOS-chem-tomas15. Journal of Geophysical Research: Atmospheres, 127, e2021JD036195. <https://doi.org/10.1029/2021JD036195>

E. X. Bonilla , L. J. Mickley , G. Raheja , S. D. Eastham , J. J. Buonocore , A. Alencar , L. Verchot , **D. M. Westervelt** , M. C. Castro. Health impacts of smoke exposure in South America: Increased risk for populations in the Amazonian Indigenous territories. Accepted Environmental Research: Health. In press. 2023

Ivey CE, Amegah AK, Hodoli CG, Kelly KE, Lawal_A, Pant P, Singh S, Subramanian R, Torres I, **Westervelt D**, and Yu H (2022). To Share Or Not To Share? Academic Incentives May Hamper Public Good. *Environmental Science & Technology*, 55, 22, 15072–15081. <https://pubs.acs.org/doi/10.1021/acs.est.2c05721>

Hancock, S.**, Fiore, A.M., **Westervelt D.M.**, Correa, G., Lamarque, J.-F., Venkataraman, C., Sharma, A. “Changing PM 2.5 and related meteorology over India from 1950-2014: A new perspective from a chemistry-climate model ensemble”. Volume 2, 015003
DOI 10.1088/2752-5295/acb22a

McFarlane, C.M.**, Raheja, G.**, Malings., C., Appoh, Emmanuel K.E., Hughes, Alison Felix, and **Westervelt, D.M.** "Application of Gaussian Mixtrue Regression for the Correction of Low Cost PM2.5 Monitoring Data in Accra, Ghana". ACS Earth and Space Chemistry. 10.1021/acsearthspacechem.1c00217, 2021

McFarlane, C**., Isevlambire, P.K., Lumbuenamo, R.S., Ndinga, A.M.E., Dhammapala, R., Jin, X., McNeill, V.F., Malings, C., Subramanian, R. **Westervelt, D.M.** (2021). First Measurements of Ambient PM_{2.5} in Kinshasa, Democratic Republic of Congo and Brazzaville, Republic of Congo Using Field-calibrated Low-cost Sensors. *Aerosol Air Qual. Res.* <https://doi.org/10.4209/aaqr.200619>

M. Sebastian, V. P. Kanawade, V. K. Soni, E. Asmi, **D. M. Westervelt**, V. Vakkari, A.-P. Hyvarinen, J. R. Pierce: New Particle Formation and Growth to Climate-relevant Aerosols at a High Altitude Site in the Western Himalaya, *J. Geophys. Res.*, 2021.

Westervelt, D. M., Fiore, A. M., Baublitz, C. B., and Correa, G.: Impact of regional Northern Hemisphere mid-latitude anthropogenic sulfur dioxide emissions on local and remote tropospheric oxidants, *Atmos. Chem. Phys.*, 21, 6799–6810, <https://doi.org/10.5194/acp-21-6799-2021>, 2021.

Michael R. Giordano, Carl Malings, Spyros N. Pandis, Albert A. Presto, V.F. McNeill, **Daniel M. Westervelt**, Matthias Beekmann, R. Subramanian, From low-cost sensors to high-quality data: A summary of challenges and best practices for effectively calibrating low-cost particulate matter mass sensors, *Journal of Aerosol Science*, Volume 158, 2021, 105833, ISSN 0021-8502, <https://doi.org/10.1016/j.jaerosci.2021.105833>.

Song Liu, Jia Xing, **Westervelt, D.M.**, Shuchang Liu, Dian Ding, Arlene M. Fiore, Patrick L. Kinney, Yuqiang Zhang, Mike Z. He, Hongliang Zhang, Shovan K. Sahu, Fenfen Zhang, Bin Zhao, Shuxiao Wang, Role of emission controls in reducing the 2050 climate change penalty for PM_{2.5} in China, *Science of The Total Environment*, Volume 765, 2021, 144338,SSN 0048-9697, <https://doi.org/10.1016/j.scitotenv.2020.144338>.

Westervelt, D. M., You, Y., Li, X., Ting, M., Lee, D. E., & Ming, Y. (2020). Relative importance of greenhouse gases, sulfate, organic carbon, and black carbon aerosol for South Asian monsoon rainfall changes. *Geophysical Research Letters*, 47, e2020GL0883 63

Malings, C., **Westervelt, D. M.**, Hauryliuk, A., Presto, A. A., Grieshop, A., Bittner, A., Beekmann, M., and R. Subramanian: Application of low-cost fine particulate mass monitors to convert satellite aerosol optical depth to surface concentrations in North America and Africa, *Atmos. Meas. Tech.*, 13, 3873–3892, <https://doi.org/10.5194/amt-13-3873-2020>, 2020.

Allen, R. J., Turnock, S., Nabat, P., Neubauer, D., Lohmann, U., Olivie, D., Oshima, N., Michou, M., Wu, T., Zhang, J., Takemura, T., Schulz, M., Tsigaridis, K., Bauer, S. E., Emmons, L., Horowitz, L., Naik, V., van Noije, T., Bergman, T., Lamarque, J.-F., Zanis, P., Tegen, I., **Westervelt, D. M.**, Le Sager, P., Good, P., Shim, S., O'Connor, F., Akritidis, D., Georgoulas, A. K., Deushi, M., Sentman, L. T., John, J. G., Fujimori, S., and Collins, W. J.: Climate and air quality impacts due to mitigation of non-methane near-term climate forcers, *Atmos. Chem. Phys.*, 20, 9641–9663, <https://doi.org/10.5194/acp-20-9641-2020>, 2020.

Westervelt, D. M., Mascioli, N. R., Fiore, A. M., Conley, A. J., Lamarque, J.-F., Shindell, D. T., Faluvegi, G., Previdi, M., Correa, G., and Horowitz, L. W.: Local and remote mean and extreme temperature response to regional aerosol emissions reductions, *Atmos. Chem. Phys.*, 20, 3009–3027, <https://doi.org/10.5194/acp-20-3009-2020>, 2020.

Baublitz, C.B, Fiore, A.M; Clifton, O.E.; Mao, J.; Li, J.; Correa, G., **Westervelt, D. M.**, Horowitz, L.W., Paulot, F.; Williams, A.P., (2020). Sensitivity of Tropospheric Ozone Over the Southeast USA to Dry Deposition. *Geophysical Research Letters*, 47, e2020GL087158. <https://doi.org/10.1029/2020GL087158>

Amiri-Farahani, A., Allen, R.J., Li, King-Fai, Nabat, P., and **Westervelt, D.M.** A La Niña-like climate response to south African biomass burning aerosol in CESM simulations. Accepted in *JGR-Atmospheres*, 2020. <https://doi.org/10.1029/2019JD031832>

Li, Xiaoqiong, Ting, Mingling, You, Yujia, Lee, Dong Eun, **Westervelt, D. M.** Ming, Yi., South Asian summer monsoon response to aerosol-forced sea surface temperatures. Vol 47, Issue 1. 2020 <https://doi.org/10.1029/2019GL085329>

Nicely, J. M., Duncan, B. N., Hanisco, T. F., Wolfe, G. M., Salawitch, R. J., Deushi, M., Haslerud, A. S., Jöckel, P., Josse, B., Kinnison, D. E., Klekociuk, A., Manyin, M. E., Marécal, V., Morgenstern, O., Murray, L. T., Myhre, G., Oman, L. D., Pitari, G., Pozzer, A., Quaglia, I., Revell, L. E., Rozanov, E., Stenke, A., Stone, K., Strahan, S., Tilmes, S., Tost, H., **Westervelt, D. M.**, and Zeng, G.: A machine learning examination of hydroxyl radical differences among model simulations for CCMI-1, *Atmos. Chem. Phys.*, 20, 1341–1361, <https://doi.org/10.5194/acp-20-1341-2020>, 2020

Westervelt, D.M., Ma, C.T., He, M.Z., Fiore, A.M, Kinney, P.L, Kioumourtzoglou, M.-A., Wang, S., Xing, J., Ding., D, Correa, G. Mid-21st century ozone air quality and health burden in China under emissions scenarios and climate change. *Environmental Research Letters*. 14, 2019, 074030, doi: <https://iopscience.iop.org/article/10.1088/1748-9326/ab260b>

Fanourgakis, G.S.; Kanakidou, M.; Nenes, A.; Bauer, S.E.; Bergman, T.; Carslaw, K.S.; Grini, A.; Hamilton, D.S.; Johnson, J.S.; Karydis, V.A.; Kirkevåg, A.; Kodros, J.K.; Lohmann, U.; Luo, G.; Makkonen, R.; Matsui, H.; Neubauer, D.; Pierce, J.R.; Schmale, J.; Stier, P.; Tsigaridis, K.; van Noije, T.; Wang, H.; Watson-Parris, D.; **Westervelt, D.M.**; Yang, Y.; Yoshioka, M.;

Daskalakis, N.; Decesari, S.; Gysel Beer, M.; Kalivitis, N.; Liu, X.; Mahowald, N.M.; Myriokefalitakis, S.; Schroedner, R.; Sfakianaki, M.; Tsimpidi, A.P.; Wu, M.; and Yu, F., 2019: Evaluation of global simulations of aerosol particle number and cloud condensation nuclei, and implications for cloud droplet formation. *Atmos. Chem. Phys.*, doi:10.5194/acp-2018-1340

Westervelt, D. M., Conley, A. J., Fiore, A. M., Lamarque, J.-F., Shindell, D. T., Previdi, M., Mascioli, N. R., Faluvegi, G., Correa, G., and Horowitz, L. W.: Connecting regional aerosol emissions reductions to local and remote precipitation responses, *Atmos. Chem. Phys.*, 18, 12461-12475, <https://doi.org/10.5194/acp-18-12461-2018>, 2018.

Conley, A.J., **Westervelt, D.M.**, Lamarque, J.-F., Fiore, A.M., Shindell, D., Correa, G., Faluvegi, G., Horowitz, L.W. Multi-model surface temperature responses to removal of U.S. sulfur dioxide emissions. *J. Geophys Res.* 123, no. 5, 2773-2796, doi:10.1002/2017JD027411. 2018

Liu T., Marlier M.E., DeFries R.S., **Westervelt D.M.**, Xia K.R., Fiore A.M., Mickley L.J., Cusworth D.H., and Milly G. Seasonal impact of regional outdoor biomass burning on air pollution in three Indian cities: Delhi, Bengaluru, and Pune. *Atmos Environ* 172, 83-92, <https://doi.org/10.1016/j.atmosenv.2017.10.024>, 2018

Westervelt, D. M., A. J., Conley, A. M., Fiore, J.-F., Lamarque, D., Shindell, M., Previdi, G., Faluvegi, G., Correa, and L. W., Horowitz (2017), Multimodel precipitation responses to removal of U.S. sulfur dioxide emissions, *J. Geophys. Res. Atmos.*, 122, doi:10.1002/2017JD026756.

Westervelt, D.M., L.W. Horowitz, V. Naik, A.P.K. Tai, A.M. Fiore, D.L. Mauzerall, Quantifying PM2.5-meteorology sensitivities in a global climate model, *Atmospheric Environment*, ISSN 1352-2310, <http://dx.doi.org/10.1016/j.atmosenv.2016.07.040>, 2016

Westervelt, D. M., Horowitz, L. W., Naik, V., Golaz, J.-C., and Mauzerall, D. L.: Radiative forcing and climate response to projected 21st century aerosol decreases, *Atmos. Chem. Phys.*, 15, 12681-12703, doi:10.5194/acp-15-12681-2015, 2015

Pierce, J. R., **Westervelt, D. M.**, Atwood, S. A., Barnes, E. A., and Leitch, W. R.: New-particle formation, growth and climate-relevant particle production in Egbert, Canada: analysis from 1 year of size-distribution observations, *Atmos. Chem. Phys.*, 14, 8647-8663, doi:10.5194/acp-14-8647-2014, 2014

Westervelt, D. M., Pierce, J. R., and Adams, P. J.: Analysis of feedbacks between nucleation rate, survival probability and cloud condensation nuclei formation, *Atmos. Chem. Phys.*, 14, 5577-5597, doi:10.5194/acp-14-5577-2014, 2014.

D'Andrea, S. D., Hakkinen, S. A. K., **Westervelt, D. M.**, Kuang, C., Levin, E. J. T., Kanawade, V. P., Leitch, W. R., Spracklen, D. V., Riipinen, I., and Pierce, J. R.: Understanding global secondary organic aerosol amount and size-resolved condensational behavior, *Atmos. Chem. Phys.*, 13, 11519-11534, doi:10.5194/acp-13-11519-11534, 2013

Westervelt, D. M., Pierce, J. R., Riipinen, I., Trivitayanurak, W., Hamed, A., Kulmala, M., Laaksonen, A., Decesari, S., and Adams, P. J.: Formation and growth of nucleated particles into cloud condensation nuclei: model-measurement comparison, *Atmos. Chem. Phys.*, 13, 7645-7663, doi:10.5194/acp-13-7645-2013, 2013

Hennigan, C. J., **Westervelt, D.M.**, I. Riipinen, G. J. Engelhart, T. Lee, J. L. Collett Jr., S. N. Pandis, P. J. Adams, and A. L. Robinson (2012), New particle formation and growth in biomass burning plumes: An important source of cloud condensation nuclei, *Geophys. Res. Lett.*, 39, L09805, doi:10.1029/2012GL050930.

Westervelt, D. M., Moore, R. H., Nenes, A., and Adams, P. J.: Effect of primary organic sea spray emissions on cloud condensation nuclei concentrations, *Atmos. Chem. Phys.*, 12, 89-101, doi:10.5194/acp-12-89-2012, 2012.

Pierce, J. R., Leaitch, W. R., Liggio, J., **Westervelt, D. M.**, Wainwright, C. D., Abbatt, J. P. D., Ahlm, L., Al-Basheer, W., Cziczo, D. J., Hayden, K. L., Lee, A. K. Y., Li, S.-M., Russell, L. M., Sjostedt, S. J., Strawbridge, K. B., Travis, M., Vlasenko, A., Wentzell, J. J. B., Wiebe, H. A., Wong, J. P. S., and Macdonald, A. M.: Nucleation and condensational growth to CCN sizes during a sustained pristine biogenic SOA event in a forested mountain valley, *Atmos. Chem. Phys.*, 12, 3147-3163, doi:10.5194/acp-12-3147-2012, 2012

Snow-Kropla, E. J., Pierce, J. R., **Westervelt, D. M.**, and Trivitayanurak, W.: Cosmic rays, aerosol formation and cloud-condensation nuclei: sensitivities to model uncertainties, *Atmos. Chem. Phys.*, 11, 4001-4013, doi:10.5194/acp-11-4001-2011, 2011

Book chapters

Donahue, N. M., Posner, L. N., **Westervelt, D. M.**, Li, Z., Shrivastava, M., Presto, A. A., Sullivan, R. C., Adams, P. J., Pandis, S. N., Robinson, A. L.: Where Did This Particle Come From? Sources of Particle Number and Mass for Human Exposure Estimates. *Airborne Particulate Matter: Sources, Atmospheric Processes, and Health*. pp. 35–71., doi:10.1039/9781782626589-00035, 2016.

Invited Presentations

American Meteorological Society 2023 Annual Meeting (Invited)	Jan 2023
Department Seminar, US EPA Office of Research and Development “Getting useful, actionable air quality data from low cost sensors in the US and abroad”	July 2022
Department Seminar, US EPA Region 2 Office (NY, NJ, PR, VI) “Getting useful, actionable air quality data from low cost sensors in the US and abroad”	May 2022
Workshop on The Power of TROPOMI to bridge African science and policy “Air quality data analysis and capacity building in Africa”	April 2022
Tri-MIP 3: AerChemMIP, PDRMIP, and RAMIP “Developing emulators of climate responses to regional aerosol perturbations using three coupled chemistry-climate models”	Nov 2021
Department Seminar, North Carolina State A&T University “Towards closing the air pollution data gap in sub-Saharan Africa”	Nov 2021

Workshop on a Pilot Design for Air Quality in Africa	Jun 2021
First measurements of PM _{2.5} in Togo and the Democratic Republic of Congo	
European Geophysical Union (invited)	April 2021
“Developing emulators of regional climate responses to regional aerosol perturbations using three coupled chemistry-climate models”	
iLEAPS Early Career Meeting	Nov 2020
“Towards closing the air pollution data gap in sub-Saharan Africa”	
US Department of State Air Quality Fellows Seminar	Sep 2020
“Towards closing the air pollution data gap in sub-Saharan Africa”	
Digital Air Quality, A Systems Approach to Air Pollution	Aug 2020
“Columbia University’s air quality research in Africa”	
MAIA Science Team Meeting (virtual due to COVID19)	May 2020
Makerere University, Kampala, Uganda	Aug 2019
Air Pollution in Africa: Current research and future directions at Columbia University	
University of Birmingham / Population Council Air Pollution Workshop	Aug 2019
Air Pollution in Africa: Current research and future directions at Columbia University	
USAID Air Pollution Solutions Workshop, New York, NY	April 2019
Development of a low cost air pollution sensor network in sub-Saharan Africa	
Georgia Institute of Technology, Department of Earth and Atmospheric Science	Feb 2019
The Atmospheric Chemistry, Air Quality, and Climate Change Nexus: From the nano to the global scale”	
American Geophysical Union Fall Meeting 2018	Dec 2018
Washington, DC. “Connecting regional aerosol emissions reductions to local and remote precipitation responses”. Invited, GH11C: Short-Lived Pollutants in the Human–Climate System	
Columbia Mailman School of Public Health Climate and Health Department Seminar.	Sep 2018
“Mid-21st century ozone air quality in China under emissions scenarios and climate change”	
Nanjing Agricultural University, Department of Environmental Science	July 2018
“Air pollution and climate change research at Columbia”	
Rutgers University, Department of Environmental Sciences Seminar	May 2018
“The Air Quality – Climate Change Nexus: From the nano to the global scale”	
Ball State University, Department of Environmental Management	May 2018
“The Air Quality – Climate Change Nexus: From the nano to the global scale”	
New York University, Department of Environmental Engineering Department Seminar.	Mar 2017
“All about atmospheric aerosols: from air quality to climate change”. New York, NY	
American Geophysical Union Fall Meeting 2016	Dec 2016

San Francisco, CA. “The impact of sulfate removal on global and regional precipitation in three coupled climate models”. A11L: Tropospheric Chemistry-Climate Interactions

Lamont-Doherty Earth Observatory Ocean and Climate Physics Seminar Jan 2016
Palisades, NY. “Taming the aerosol monster: a multimodel approach to elucidating the cloud and precipitation response to regional changes in aerosol emissions”

Teaching Experience

Adjunct Professor, Tandon School of Engineering, New York University Fall 2017-
Courses: CE-GY 7523, Air Pollution. Graduate-level class. Overall evaluation: present
4.6 / 5.0

CE-UY 3223, Introduction to Environmental Engineering

Faculty, New Jersey Scholars Program, The Lawrenceville School Summer 2015

Taught summer course on “Climate Change and the Human Experience”

Encouraging Networks between Geoscience and Geoscience Education (ENGAGE) workshop Jan 2015

Held in Washington, DC. Sponsored and funded by National Science Foundation.

Eberly Center for Teaching Excellence Future Faculty Program 2012-2013

Completed teaching observations, course and syllabus development, attended seminars

Guest Lecturer, Introduction to Atmospheric Chemistry. Columbia Mar 2016, 2017,
University. Sulfate-nitrate-ammonium atmospheric thermodynamics. 2019, 2020

Guest Lecturer, Fundamentals of Atmospheric Aerosols (CU). April 2017, 2018
Taught 2 lecture (3 hours each) on aerosol microphysics

Guest Lecturer, Fundamentals of Atmospheric Aerosols (CMU) 2013

Taught 3 lectures on single particle dynamics, aerosol size distributions, and aerosol and cloud optical properties

Teaching and Lab Assistant, Various Classes 2009-2013

Assisted lab sessions, taught guest lectures, held weekly office hours, administered exams, grading

Students and postdocs advised

Benjamin Yang 2021 – present
Lamont/DEES PhD student

Garima Raheja 2021 - present
Lamont/DEES PhD Student

Savannah Ward LDEO Summer Intern	Summer 2021- Summer 2022
Zhonghua Zheng Postdoctoral Research Scientist	Spring 2021 – Spring 2022
Oreoluwa Solanke LDEO Summer intern	Summer 2020
Sarah Hanock LDEO Summer Intern	Summer 2020
Celeste McFarlane Undergraduate researcher (ChemE)	Spring 2020 – Fall 2021
William Tsui PhD defense committee	Spring 2020
Alison Fankhauser PhD defense committee	Fall 2020
Chang Wang MS Environmental Engineering (Dec 2019) Poster presented at AGU 2019	Fall 2019
Anant Majumdar Earth Institute Intern (BA Computer Science 2020).	Spring 2019
Clara T. Ma LDEO summer intern. (BS Geology and Geophysics Yale 2020) Oral presentation given by Clara at AGU Fall Meeting 2017	Summer 2017
Karen Xia Earth Institute Intern (BS Computer Science and Statistics 2018) Poster presented at AAAR 35 th annual fall meeting.	2015-2017
Karen Yu Undergraduate intern. (BS CMU Environmental Engineering 2012, PhD Harvard Atmospheric Science 2019)	2010-2012

Committees and Professional Development

LDEO Mentoring and Justice, Equity, Diversity, and Inclusion Committee (JEDI)
2019-present

Lamont Colloquium Faculty Coordinator and Committee Chair
Responsible for overseeing Colloquium, inviting speakers. 2022-2023

Lamont Executive Committee
Junior faculty representative, 2022-2024

Meeting organizer

Clean Air Monitoring and Solutions Network, CAMS-Net, symposium at Air Sensors International Conference, May 2022

Meeting organizer

Air Quality Certificate Program in East Africa. July 25-29 2021. Online

Meeting organizer

Columbia University Air Pollution Roundtable. Nairobi, Kenya. August 26, 2019. Columbia Global Centers

Meeting co-organizer

“Air Pollution Extremes”. Columbia University Initiative on Extreme Weather. November 1-2, 2018

Session Convener and Chair

“Interactions of Air Quality and Meteorology on Local to Synoptic Scales”. AGU Fall Meeting 2017. New Orleans, LA and AGU Fall Meeting 2018, Washington, DC, and 2019 at San Francisco, CA.

Session Chair

“Carbonaceous Aerosols in the Atmosphere”. American Association for Aerosol Research 34th annual meeting. Minneapolis, MN. Oct. 2015

Peer reviewer

Atmospheric Chemistry and Physics, Geoscientific Model Development, Atmospheric Environment, Journal of the Advances of Modeling Earth Systems, Aerosol Science and Technology, Environmental Science and Technology, Journal of Geophysical Research, Geophysical Research Letter, Nature Climate Change

President

American Association of Aerosol Research Carnegie Mellon Chapter (2012)
Secured funding and started guest speaker series, supervised creation of an air quality community awareness blog

Poster Judge, student poster competition

AGU 2014, 2016, 2017, 2018, 2019, 2020 AAAR 2014, 2015, 2016, 2019, 2020, 2021

Field Work and International Capacity Building

Kigali, Rwanda: March 2023

Puerto Rico: February 2023

Kigali, Rwanda; Nairobi, Kenya; Mombasa, Kenya, Jan 2023

Marrakech, Morocco, Oct-Nov 2022

Accra and Kumasi, Ghana, June 2022

Lomé, Togo, July 2022

Nairobi and Mombasa, Kenya, July 2021

Accra, Ghana, February 2020

Lomé, Togo, March 2020

Nairobi, Kenya, August 2019

Kampala, Uganda, September 2019

Mumbai, India, February 2016

Outreach Activities

Department of State Air Quality Advisor, 2017-present

National Society for Black Engineers Career Workshop, Guest Speaker, November 2021

Lamont-Doherty Earth Observatory Open House Public Speaker. October 2019

New York State Science and Engineering Fair Judge, March 2017, New York, NY

Lamont-Doherty Earth Observatory Open House. Oct 2016, 2018. Palisades, NY.
Designed and conducted a “clouds in a jar” experiment at the Ocean and Climate Physics booth.

Invited guest speaker, St. Thomas Aquinas College Earth Day Fair, 2016

Early career researcher panel member, 2015-2016, Various occasions at LDEO

Judge, 2012 Pittsburgh Regional Middle and High School Science Fair

Honors and awards

Fellow, Columbia Center for Climate and Life (2019-2022)

Science, Technology, and Environmental Policy Research Fellowship (2013-2014)

Dean’s Fellowship, Carnegie Mellon University (2009-2010)