M. OMAR NAWAZ, PhD

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Research Overview

My research program applies atmospheric science tools such as chemical transport modeling, remote sensing, and inverse methods to public health questions. I explore how climate mitigation and air pollution control could benefit public health and ameliorate global inequalities.

Professional Appointments

2025-Current	**Lecturer of Climate Change Science**, Cardiff University, Cardiff, Wales, UK
2024	**Professorial Lecturer**, GWU, Washington, DC, USA
2023-2024	**NRDC Health Science Policy Fellow**, GWU, Washington, DC, USA
2023-2025	**Postdoctoral Research Associate**, GWU, Washington, DC, USA
2018-2023	**PhD Research Assistant**, CU Boulder, Boulder, CO, USA
2016-2018	**MSc Research Assistant**, UNC Chapel Hill, Chapel Hill, NC, USA

Education

2023	**PhD**, Mechanical Engineering, Air Quality Focus, CU Boulder, Boulder, CO, USA *Research Supervisor:* Professor Daven K. Henze *Thesis:* An adjoint sensitivity framework for public health: the sources of air pollution and their current and future impacts at the urban and national scale
2018	**MSc**, Environmental Engineering, UNC Chapel Hill, Chapel Hill, NC, USA *Research Supervisor:* Professor J. Jason West *Thesis:* Benefits of reduced premature mortality from decreases in $PM_{2.5}$ and ozone in the United States from 1999 to 2015
2017	**BSc**, Physics, UNC Chapel Hill, Chapel Hill, NC, USA
2017	**BSc**, Applied Mathematics, UNC Chapel Hill, Chapel Hill, NC, USA

Research Funding

Total Funded: £636,000; **Total Pending:** £2,110,000

Current

2026	*Forward and adjoint modeling of transboundary secondary $PM_{2.5}$ in response to climate mitigation*, UKRI, (75,000 Node-hrs), **PI**
2025-2026	*Maximizing health benefits from reducing oil and gas emissions*, Wellcome Trust, (£496,000*), **Institutional PI**
2025-2026	*Health benefits of transitioning to zero emission vehicles by 2050,* International Council on Clean Transportation, (£14,000), **Consultant**
2025-2026	*Estimating UK surface-level pollution from satellite data using machine learning and deterministic modeling*, Supercomputing Wales, (100,000 CPU-hrs), **PI**
2024-2027	*Application of satellite observations in estimating NO_2 concentrations, mortality burdens, and inequities*, NASA, (£112,000*), **Collaborator**

Pending

2026-2032 *ACCEPT: Assessing Climate Change effects on Equity and Public health from Transboundary air pollution*, Wellcome Trust (£2,110,000), **PI**

Past

2024 *Study of Global Maritime Shipping-Attributable Health Impacts and Policy Benefits*, ICCT, (£5,000), **Consultant**

2023-2025 *Study of Global Transportation-Attributable Health Impacts and Policy Benefits*, ICCT, (£9,000*), **Consultant**

Competitive Grants Not Selected for Funding

2024 *HEAD-IN: Assessing disaster risk and resilience action benefits associated with compound heat and air quality hazards, exposures, and vulnerabilities*, NASA, (£759,000*), **PI**

2020 *Development of a source attribution and data assimilation framework for MAIA primary and secondary target areas in North America and South America*, NASA, (£112,000*), **Future Investigator**

**Funding total converted to GBP from other currency and rounded to nearest thousand*

Teaching Experience

Cardiff University, School of Earth and Environmental Sciences

2026 Spring **Lecturer** for **Climate Change Adaptation and Resilience**
Module for ~20 Postgraduate Students

- **Topic:** Methods and approaches for adapting and building resilience to climate change and understanding climate projections
- **Responsibilities:** Develop materials and exercises for class, facilitate seminar discussions, mark posters and writings for class

2025 Fall **Lecturer (Module Leader)** for **The Ocean-Atmosphere System**
Module for ~130 Year 2 Undergraduate Students

- **Topic:** Understanding the physical and chemical processes of the atmosphere using analytical lecture-based learning and practical approaches (MATLAB)
- **Responsibilities**: Develop and deliver materials for lectures and practicals, design module curriculum and outcomes, facilitate assessments, marking and feedback, supervise teaching assistants, manage online learning platform, administrative duties (e.g., representing module for board of studies meetings)

Lecturer for **GIS, Maps, and Analytical Skills**
Module for ~220 Year 1 Undergraduate Students

- **Topic:** Theoretical foundations and practical applications of GIS with skills in map interpretation, data acquisition, and statistical analysis for environmental sciences
- **Responsibilities**: Develop and deliver materials for lectures and practicals, create GIS exercises, manage online learning platform, supervise teaching assistants, facilitate assessments, marking, and feedback

Supervisor for **Environmental Geography Undergraduate Dissertations**
Course for Year 3 Undergraduate Students

- **Topics:** Supervise undergraduate students on dissertation topics in environmental geography including air quality analyses and flood risk assessments
- **Responsibilities:** Support students in developing their research focus and writing their dissertations, regularly meet with supervisees individually and in groups

Tutor for **Environmental and Physical Geography Students**
Tutorials for Undergraduate Students (All Years)

- **Responsibilities:** Lead weekly tutorials for Year 1, Year 2, and Year 3 undergraduate students in groups of 4 – 6 students, provide pastoral support, assist students in goal setting, signpost university resources

2025 Spring **Lecturer** for **Digital Fieldwork Workshop**
Module for ~130 Year 1 Undergraduate Students

- **Topic:** Theoretical foundations in data analysis software (i.e., excel and MATLAB) and applications of analysis skills for large environmental datasets
- **Responsibilities:** Assessment lead, developed, presented, and marked a data analysis climate risk assessment, set-up rubric and collated staff marks for summative assessment

George Washington University, Department of Environmental and Occupational Health

2024 Fall **Professorial Lecturer** for **Global Climate Change & Air Pollution**
Course for Postgraduate Students

- **Topic**: Linkages between climate change, air pollution, health, and policy; understanding how to assess the health implications of climate change.
- **Responsibilities:** Delivered lectures, led in-class seminars linking class material to research / current events, proctored exams, graded assignments and presentations

University of Colorado Boulder, Department of Mechanical Engineering

2020 Summer **Student Lead and Mentor** for **Fluid Mechanics and Thermodynamics Exams**
Review for PhD Students

- **Topic:** Fundamental fluid mechanics and thermodynamics topics for PhD students preparing for their oral preliminary exams.
- **Responsibilities:** Assessed students in mock preliminary exams, provided formative feedback on their ability to work through thermodynamics and fluid mechanics exercises, worked through derivations and practice exercises on the white board for PhD students

2019 Spring **Lead Teaching Assistant** for **Numerical Methods for Engineers**
Course for Undergraduate Students

- **Topic**: Numerical and computational approaches for solving engineering problems using MATLAB.
- **Responsibilities:** Led a team of teaching assistants, marked in-class MATLAB coding exercises, proctored midterm and final exams, provided coding advice and support for a class of ~ 100 undergraduates

2018 Fall **Teaching Assistant** for **Numerical Methods for Engineers**
Course for Undergraduate Students

- **Topic**: Numerical and computational approaches for solving engineering problems using MATLAB.
- **Responsibilities: M**arked in-class MATLAB coding exercises, proctored midterm and final exams, provided coding advice and support for a class of ~ 100 undergraduates

Supervision Experience

Formal Supervision

PhD Feichi Hu (Co-supervised with L. Zhuo), *Current*

MSc Kyla Camama, *Current*

BSc Niamh Delamar, *Current*
Alice Gittoes-Davies, *Current*
Carwyn Jones, *Current*
Olivia Pease, *Current*
Mohammed Alwakeel, *2019 – 2021*

Informal Supervision

2025 Review panel member for a PhD researcher on methane remote sensing
2025- Pastoral mentoring for a MS student as part of the EQUATOR program
2023-2024 Led a team of 2 MS researchers as a NRDC Science Policy Fellow
2023-2024 Advised a PhD student on transportation pollution modeling project for the ICCT
2024 Reviewed and advised a PhD student on accepted NASA FINESST proposal
2024 Supervised undergraduate on research that supported a NASA proposal
2020 Student lead and mentor for fluid mechanics and thermodynamics PhD exams

Honors and Fellowships

2026 GW4 Crucible 2026 Cohort
2024-2025 GeoCAFE Scholar
2023-2024 Natural Resources Defense Council Health Science Policy Fellowship
2018 Outstanding Mechanical Engineering Research Potential Fellowship
2018 1st place student poster Award, UNC 5th Climate Change Symposium

Professional Associations

Current

2025- TOAR-II Health Team
2024- Global Burden of Disease Study Collaborator
2023- European Geophysical Union
2018- American Geophysical Union

Past

2025	EQUATOR Mentor
2024-2025	American Chemistry Society (ACS)
2023-2024	American Meteorological Society

Media Coverage

2025	BBC: How air pollution has changed since steelmaking ended in Port Talbot
2025	Health benefits of transportation policies
2023	The Global Health Benefits of Going Net Zero
2020	Queimadas na Amazônia aumentam internações

Academic Service

Ad-Hoc Peer-Review for Journals (33)
Atmospheric Chemistry and Physics: 2024 (1)
Discover Atmospheres: 2025 (1)
Discover Cities: 2024 (1)
Elementa: Science of the Anthropocene: 2021 (1)
Environmental Monitoring & Assessment: 2025 (1)
Environmental Research Letters: 2024 (1), 2025 (1)
Environmental Science Policy Research: 2025 (1)
Environmental Science & Technology: 2023 (1), 2022 (1), 2019 (1)
Environmental Science & Technology Air: 2024 (1)
GeoHealth: 2024 (2), 2023 (1)
Geoscience Letters: 2026 (1)
Health Data Science: 2024 (1)
Humanities & Social Science Communication: 2025 (1)
International Geoscience and Remote Sensing Symposium: 2024 (6)
Journal of the Air and Waste Management Association: 2019 (1)
Nature Cities: 2025 (1)
Nature Communications: 2025 (1)
Nature Food: 2024 (1)
Nature Health: 2025 (3), 2026 (1)
NPJ Clean Air: 2025 (1)
NPJ Climate & Atmospheric Science: 2025 (1)
Lancet Planetary Health: 2021 (1)
PLOS: 2025 (1)
Scientific Reports: 2024 (1)

Ad-Hoc Peer-Review for Proposals (2)
Wellcome Trust Expert Reviewer: 2025 (2)

Department Service

- Equality Diversity and Inclusivity leadership team (*Cardiff University*)
    - Organized EDI away day to discuss Athena Swan Silver bid
    - Development of poster campaign on microaggressions
    - Contributed to the monthly EDI newsletter
- Member of the School Ethics Committee (*Cardiff University*)

    - Reviewed undergraduate and staff research plans for ethics considerations
- Delivered IT induction for Year 1 students (*Cardiff University*)
- Volunteered at school open days to recruit prospective students (*Cardiff University*)
- Coordinator for the CAQR air quality seminar series (*University of Colorado Boulder*)
- Volunteer presenter for "Mechanical Engineering as a Profession" (MCEN 2000) research round tables (*University of Colorado Boulder*)
- Student presenter and volunteer for the "Graduate Engineering Annual Research & Recruiting Symposium" (GEARRS) (*University of Colorado Boulder*)

Other Professional Service

- Session convener on air quality, climate, health, and equity for EGU 2026 meeting
- Session convener on air quality, climate, health, and equity at EGU 2025 meeting
- Coordinator for the CMAS conference in Chapel Hill, NC

Publications (31)

Total citations: 565; **h-index**: 11*(Google Scholar)*

Refereed Journal Articles (24)

2026 **Nawaz, M. O.;** Henze, D. K. National Climate Action Can Ameliorate, Perpetuate, or Exacerbate International Air Pollution Inequalities. *Nature Communications* 2026. https://doi.org/10.1038/s41467-026-68827-0.

2025 Siu, T. K.; Goldberg, D. L.; Kerr, G. H.; Chen, L.; **Nawaz, M. O.**; Chang, R. Y.-W.; Fong, K. C. Tropospheric NO2 Patterns in Eastern Canada Using the First Year of TEMPO Observations. *Journal of Geophysical Research: Atmospheres* **2025**, *130* (24), e2025JD044757. https://doi.org/10.1029/2025JD044757.

2025 Goldberg, D. L.; **Nawaz, M. O.**; Lyu, C.; He, J.; Carlton, A. G.; Kondragunta, S.; Anenberg, S. C. Clear-Sky and Cloudy-Sky Differences in NO_2 Concentrations over the United States: Implications for Satellite Measurement Applications. *Atmospheric Chemistry and Physics* **2025**, *25* (22), 16287–16302. https://doi.org/10.5194/acp-25-16287-2025.

2025 **Nawaz, M. O.**; Huber, D. E.; Kerr, G. H.; Judd, L. M.; Acker, S. J.; Goldberg, D. L. A Comparative Analysis of TEMPO NO2 Remote Sensing With Surface-Level Monitoring Through Diurnal and Seasonal Trends, Meteorology, and Monitor Characteristics. *Journal of Geophysical Research: Atmospheres* **2025**, *130* (20), e2025JD043923. https://doi.org/10.1029/2025JD043923.

2025 Hay, S. I.; Ong, K. L.; Santomauro, D. F.; … **Nawaz, M. O.**; … et al. Burden of 375 Diseases and Injuries, Risk-Attributable Burden of 88 Risk Factors, and Healthy Life Expectancy in 204 Countries and Territories, Including 660 Subnational Locations, 1990–2023: A Systematic Analysis for the Global Burden of Disease Study 2023. *The Lancet* **2025**, *406* (10513), 1873–1922. https://doi.org/10.1016/S0140-6736(25)01637-X.

2025 Jin, L.; Benoit, J.; **Nawaz, M. O.**; Rodrigues, P. F.; Wiecko, P.; Miller, J.; Alvarez, G.; Henze, D. K.; Osipova, L.; Anenberg, S. C. Global Health Benefits of Policies to

Reduce On-Road Vehicle Pollution through 2040. *Environ. Res. Lett.* **2025**. https://doi.org/10.1088/1748-9326/adcd87.

2025 Wiecko, P.; Henze, D. K.; **Nawaz, M. O.** Sector-, Season-, and Country-Specific NO2-Associated Health Benefits from NOx Emission Reductions. *ACS EST Air* **2025**, *2* (4), 700–709. https://doi.org/10.1021/acsestair.5c00012.

2025 **Nawaz, M. O.**; Goldberg, D. L.; Kerr, G. H.; Anenberg, S. C. TROPOMI Satellite Data Reshape NO2 Air Pollution Land-Use Regression Modeling Capabilities in the United States. *ACS EST Air* **2025**, *2* (2), 187–200. https://doi.org/10.1021/acsestair.4c00153.

2024 Dyer, G. M. C.; Khomenko, S.; Adlakha, D.; Anenberg, S.; Angelova, J.; Behnisch, M.; Boeing, G.; Chen, X.; Cirach, M.; de Hoogh, K.; Diez Roux, A. V.; Esperon-Rodriguez, M.; Flueckiger, B.; Gasparrini, A.; Iungman, T.; Khreis, H.; Kondo, M. C.; Masselot, P.; McDonald, R. I.; Montana, F.; Mitchell, R.; Mueller, N.; **Nawaz, M. O.**; Pereira, E.; Pisoni, E.; Prieto-Curiel, R.; Rezaei, N.; Rybski, D.; Ramasco, J. J.; Schifanella, R.; Shabou, S.; Tatah, L.; Taubenböck, H.; Tonne, C.; Velázquez-Cortés, D.; Woodcock, J.; Zhang, Q.; Nieuwenhuijsen, M. Commentary: A Road Map for Future Data-Driven Urban Planning and Environmental Health Research. *Cities* **2024**, *155*, 105340. https://doi.org/10.1016/j.cities.2024.105340.

2024 Goldberg, D. L.; de Foy, B.; **Nawaz, M. O.**; Johnson, J.; Yarwood, G.; Judd, L. Quantifying NOx Emission Sources in Houston, Texas Using Remote Sensing Aircraft Measurements and Source Apportionment Regression Models. *ACS EST Air* **2024**, *1* (11), 1391–1401. https://doi.org/10.1021/acsestair.4c00097.

2024 Dyer, G. M. C.; Khomenko, S.; Adlakha, D.; Anenberg, S.; Behnisch, M.; Boeing, G.; Esperon-Rodriguez, M.; Gasparrini, A.; Khreis, H.; Kondo, M. C.; Masselot, P.; McDonald, R. I.; Montana, F.; Mitchell, R.; Mueller, N.; **Nawaz, M. O.**; Pisoni, E.; Prieto-Curiel, R.; Rezaei, N.; Taubenböck, H.; Tonne, C.; Velázquez-Cortés, D.; Nieuwenhuijsen, M. Exploring the Nexus of Urban Form, Transport, Environment and Health in Large-Scale Urban Studies: A State-of-the-Art Scoping Review. *Environmental Research* **2024**, *257*, 119324. https://doi.org/10.1016/j.envres.2024.119324.

2024 Choi, J.; Henze, D. K.; **Nawaz, M. O.**; Malley, C. S. Source Attribution of Health Burdens From Ambient PM2.5, O3, and NO2 Exposure for Assessment of South Korean National Emission Control Scenarios by 2050. *GeoHealth* **2024**, *8* (8), e2024GH001042. https://doi.org/10.1029/2024GH001042.

2024 **Nawaz, M. O.**; Johnson, J.; Yarwood, G.; de Foy, B.; Judd, L.; Goldberg, D. L. An Intercomparison of Satellite, Airborne, and Ground-Level Observations with WRF–CAMx Simulations of NO_2 Columns over Houston, Texas, during the September 2021 TRACER-AQ Campaign. *Atmospheric Chemistry and Physics* **2024**, *24* (11), 6719–6741. https://doi.org/10.5194/acp-24-6719-2024.

2023 Gu, Y.; Henze, D. K.; **Nawaz, M. O.**; Wagner, U. J. Response of the Ozone-Related Health Burden in Europe to Changes in Local Anthropogenic Emissions of Ozone Precursors. *Environ. Res. Lett.* **2023**, *18* (11), 114034. https://doi.org/10.1088/1748-9326/ad0167.

2023 **Nawaz, M. O.**; Henze, D. K.; Huneeus, N. J.; Osses, M.; Álamos, N.; Opazo, M. A.; Gallardo, L. Sources of Air Pollution Health Impacts and Co-Benefits of Carbon Neutrality in Santiago, Chile. *Journal of Geophysical Research: Atmospheres* **2023**, *128* (19), e2023JD038808. https://doi.org/10.1029/2023JD038808.

2023 Jo, D. S.; Nault, B. A.; Tilmes, S.; Gettelman, A.; McCluskey, C. S.; Hodzic, A.; Henze, D. K.; **Nawaz, M. O.**; Fung, K. M.; Jimenez, J. L. Global Health and Climate Effects of Organic Aerosols from Different Sources. *Environ. Sci. Technol.* **2023**, *57* (37), 13793–13807. https://doi.org/10.1021/acs.est.3c02823.

2023 Gu, Y.; Henze, D. K.; **Nawaz, M. O.**; Cao, H.; Wagner, U. J. Sources of PM2.5-Associated Health Risks in Europe and Corresponding Emission-Induced Changes During 2005–2015. *GeoHealth* **2023**, *7* (3), e2022GH000767. https://doi.org/10.1029/2022GH000767.

2023 **Nawaz, M. O.**; Henze, D. K.; Anenberg, S. C.; Ahn, D. Y.; Goldberg, D. L.; Tessum, C. W.; Chafe, Z. A. Sources of Air Pollution-Related Health Impacts and Benefits of Radially Applied Transportation Policies in 14 US Cities. *Front. Sustain. Cities* **2023**, *5*. https://doi.org/10.3389/frsc.2023.1102493.

2023 **Nawaz, M. O.**; Henze, D. K.; Anenberg, S. C.; Braun, C.; Miller, J.; Pronk, E. A Source Apportionment and Emission Scenario Assessment of PM2.5- and O3-Related Health Impacts in G20 Countries. *GeoHealth* **2023**, *7* (1), e2022GH000713. https://doi.org/10.1029/2022GH000713.

2021 **Nawaz, M. O.**; Henze, D. K.; Harkins, C.; Cao, H.; Nault, B.; Jo, D.; Jimenez, J.; Anenberg, S. C.; Goldberg, D. L.; Qu, Z. Impacts of Sectoral, Regional, Species, and Day-Specific Emissions on Air Pollution and Public Health in Washington, DC. *Elementa: Science of the Anthropocene* **2021**, *9* (1), 00043. https://doi.org/10.1525/elementa.2021.00043.

2021 Cao, H.; Henze, D. K.; Cady-Pereira, K.; McDonald, B. C.; Harkins, C.; Sun, K.; Bowman, K. W.; Fu, T.-M.; **Nawaz, M. O.** COVID-19 Lockdowns Afford the First Satellite-Based Confirmation That Vehicles Are an Under-Recognized Source of Urban NH3 Pollution in Los Angeles. *Environ. Sci. Technol. Lett.* **2021**, *9* (1), 3–9. https://doi.org/10.1021/acs.estlett.1c00730.

2021 Nault, B. A.; Jo, D. S.; McDonald, B. C.; Campuzano-Jost, P.; Day, D. A.; Hu, W.; Schroder, J. C.; Allan, J.; Blake, D. R.; Canagaratna, M. R.; Coe, H.; Coggon, M. M.; DeCarlo, P. F.; Diskin, G. S.; Dunmore, R.; Flocke, F.; Fried, A.; Gilman, J. B.; Gkatzelis, G.; Hamilton, J. F.; Hanisco, T. F.; Hayes, P. L.; Henze, D. K.; Hodzic, A.; Hopkins, J.; Hu, M.; Huey, L. G.; Jobson, B. T.; Kuster, W. C.; Lewis, A.; Li, M.; Liao, J.; **Nawaz, M. O.**; Pollack, I. B.; Peischl, J.; Rappenglück, B.; Reeves, C. E.; Richter, D.; Roberts, J. M.; Ryerson, T. B.; Shao, M.; Sommers, J. M.; Walega, J.; Warneke, C.; Weibring, P.; Wolfe, G. M.; Young, D. E.; Yuan, B.; Zhang, Q.; de Gouw, J. A.; Jimenez, J. L. Secondary Organic Aerosols from Anthropogenic Volatile Organic Compounds Contribute Substantially to Air Pollution Mortality. *Atmospheric Chemistry and Physics* **2021**, *21* (14), 11201–11224. https://doi.org/10.5194/acp-21-11201-2021.

2021 Malley, C. S.; Hicks, W. K.; Kulyenstierna, J. C. I.; Michalopoulou, E.; Molotoks, A.; Slater, J.; Heaps, C. G.; Ulloa, S.; Veysey, J.; Shindell, D. T.; Henze, D. K.; **Nawaz, M. O.**; Anenberg, S. C.; Mantlana, B.; Robinson, T. P. 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.* **2021**, *3* (7), 075001. https://doi.org/10.1088/2515-7620/ac0af9.

2020 **Nawaz, M. O.**; Henze, D. K. Premature Deaths in Brazil Associated With Long-Term Exposure to PM2.5 From Amazon Fires Between 2016 and 2019. *GeoHealth* **2020**, *4* (8), e2020GH000268. https://doi.org/10.1029/2020GH000268.

Manuscripts Under Review (4)

Submitted Morris, S. T., O'Neill, B. C., Msangi, S., **Nawaz, M.O.**, Parker, N., Rao, N., Van Vuuren, D. Modeling the human well-being dimensions of global change: priorities and challenges for research to inform decision-making. *Under Review*.

Submitted TOAR-II Health Collaborators, Tropospheric Ozone Assessment Report, Phase II: Changing Health Impacts of Global Ozone Exposure. *Under Review*.

Submitted Huber, D.E., Kerr, G.H., **Nawaz, M.O.**, Runkel, S., Anenberg, S.C., Goldberg, D.L. TROPOMI NO_2 trends for urban and polluted areas globally from 2019 to 2024. *Under Review*.

Submitted Kerr, G.H., **Nawaz, M.O.**, Anenberg, S.C., Anthoff, D., Burton, C., Carter, T.S., Henze, D.K., Kelley, D.I., Kingdon, C., O'Dell, K., Prest, B.C., Cromar, K.R. Climate-driven surges in public health damages from wildland fire-sourced pollution through 2100. *Under Review*

Manuscripts In Preparation (3)

In Prep. Graffy, P.M., …**Nawaz, M.O.**, … et al. Cumulative Air Pollution Exposure Increases the Severity of Acute Respiratory Failure: a U.S. Multicenter Study. *In Preparation*.

In Prep. Goldberg, D.L., Johnson, J., **Nawaz, M.O.**, Kerr, G.H., Chen, L., Huber, D.E., Judd, L. M. Contrasting the TEMPO and TROPOMI Views of Tropospheric NO_2: Implications for Diurnal Variability and Model Evaluation. *In preparation*.

In Prep. Kim, S.Y., Kerr, G.H., **Nawaz, M.O.**, Anenberg, S.C. Fine-scale spatiotemporal patterns of NO2 pollution and associated mortality burdens across the continental United States. *In preparation*.

Presentations (28)

Invited Talks (2)

2025 Applying machine learning and statistical modeling approaches to remote sensing observations for inferring surface-level NO_2. December 15th-19th. American Geophysical Union. New Orleans, LA, USA.

2023 Using satellite data to characterize air pollution and health in cities and countries. April 27th. Environmental Defense Fund / Climate and Clean Air Coalition / United Nations Environmental Programme Workshop for Clean Air Solutions in Latin America and the Caribbean. Bogotá, Colombia.

Oral Presentations (12)

2025 **Nawaz, M.O.**, Henze, D.K., Exploring the role of climate action in transboundary air pollution inequality using GEOS-Chem adjoint sensitivities. April 29th. European Geophysical Union. Vienna, Austria

2024 **Nawaz, M.O.**, Anenberg, S.C., Goldberg, D.L., Kerr, G.H., Kondragunta, S. Development of a Land-Use Regression of Hourly Surface NO2 in preparation for GeoXO Atmospheric Composition Data. April 17th. European Geophysical Union. Vienna, Austria.

2024 **Nawaz, M.O.**, O'Dell, K., Anenberg, S.C., Goldberg, D.L., Kerr, G.H., He, J., McDonald, B., Kondragunta, S. Value of GeoXO Atmospheric Composition Data for Estimating Air Pollution-Related Health Impacts. January 30th. American Meteorological Society. Baltimore, MD, USA.

2023 **Nawaz, M.O.,** Henze, D.K., Anenberg, S.C., Goldberg, D.L., Investigating climate co-benefits using GEOS-Chem adjoint sensitivities. August 15th. Second GEOS-Chem Europe Meeting. London, UK.

2023 **Nawaz, M.O.,** Henze, D.K., Anenberg, S.C., Tessum, C. Regional vs local sources of municipal air pollution-related health impacts. January 10th. American Meteorological Society. (Presented by Henze). Denver, CO, USA.

2022 **Nawaz, M.O.**, Henze, D.K., Anenberg, S.C., Huang, T. Developing an interactive tool for characterizing the air pollution-related health impacts in Los Angeles, CA associated with different proposed emission scenarios. July 19th. Earth Science Information Partners Meeting. Pittsburgh, PA, USA (Virtual).

2022 **Nawaz, M.O.**, Henze, D.K., Anenberg, S.C., Harkins, C., Gallardo, L., Barazza Basoa, K. Leveraging satellite-derived data in GEOS-Chem adjoint simulations to characterize the sources of PM2.5-, O3-, and NO2-related health impacts at multiple spatial scales. June 9th. 10th International GEOS-Chem Meeting. St. Louis, MO, USA. (Virtual).

2022 **Nawaz, M.O.**, Henze, D.K., Braun, C., Miller, J., Pronk, E., Anenberg, S.C. Characterizing the sources of air pollution at the urban- and country-scale: case studies in Santiago, Chile and G20 countries. February 17th. Graduate Engineering Annual Research and Recruitment Symposium. Boulder, CO, USA.

2021 **Nawaz, M.O.**, D. Henze, S.C. Anenberg, C. Braun, J. Miller. Comparing domestic and extra-regional contributions to pollutant exposures and health impacts in G20 countries through a novel adjoint modeling approach. December 15th. American Geophysical Union Fall Meeting. New Orleans, LA, USA (Virtual).

2020 **Nawaz, M.O**., D. Henze, D. Goldberg, S. Anenberg, D. Jo, B. Nault, J.L. Jimenez, H. Cao, C. Harkins, Z. Qu. Characterizing the regional, sectoral and species-specific sources of pollution exposure and its associated health impacts in urban environments: case studies in Washington, D.C. and Santiago, Chile. December 14th. American Geophysical Union. (Virtual)

2020 **Nawaz, M.O.**, Henze, D.K., Anenberg, S.C., Goldberg, D. Premature deaths in Brazil associated with long-term exposure to PM2.5 from Amazon fires and development of a nested South American domain for the GEOS-Chem Adjoint. June 23rd. 19th GEIA Conference. (Virtual)

2019 **Nawaz, M.O.**, Henze, D.K. Source attribution of PM2.5 from sensitivity analyses in the GEOS-Chem adjoint model. October 25th. Young Scientists Symposium on Atmospheric Research. Fort Collins, CO, USA.

Poster Presentations (14)

2025 **Nawaz, M.O.**, Goldberg, D.G., Anenberg, S.C., Kerr, G.H. What does low-earth orbiting, geostationary, and airborne remote-sensing reveal about surface NO_2? September 9th. UK Atmospheric Chemistry Conference. York, UK.

2025 **Nawaz, M.O.**, Southerland, V.A., Goldberg, D.G. Characterizing the air quality and health impacts from oil and gas emissions in Mexico using GCHP. August 19th. GEOS-Chem Europe Meeting 3. London, UK.

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