Nicholas Good

Nicholas Good, PhD.

Fort Collins, Colorado

Co-Founder

970-825-2832 nick@redspire.us

Experience

RedSpire LLC / Co-Founder

Jan 2025 - Present, Fort Collins, CO

Consulting services supporting clients' needs in occupational health and safety, exposure assessment, and other environmental issues.

Good Science LLC / Owner

2019 - Present, Fort Collins, CO

Providing environmental consulting services. Serving clients needs related to occupational health and safety, data analysis, and exposure modeling. In particular, work has focused on exposures related to asbestos and benzene.

CloudSci LLC / Co-Founder

2023 - Present, Fort Collins, CO

Commercialization of airborne particle measurement technologies for the research and related markets. Work has focused on research and development related to a variety of techniques and tools for the characterization of particle size, shape, and composition with a focus on difficult to measure super-micron particles and instrumentation customized for deployment on research aircraft.

Colorado State University / Research Scientist III

2020 - Present, Fort Collins, CO

Department of Civil and Environmental Engineering. Leading and implementing research related to air quality and human health, with a focus on indoor air quality, building performance, bioaerosols, and the novel health effects of air pollution. A focus of the work has been at the intersection of building energy efficiency and indoor air quality. Work has included projects to develop scalable approaches for commercial building air quality assessments. Recent work has focused on the interplay between policy and indoor air quality mitigation strategies. Work has also included developing modeling approaches to relate multi-decadal air pollution exposure potential and cognitive health outcomes in longitudinal cohorts.

Colorado State University / Research Scientist I

2017 - 2020, Fort Collins, CO

Department of Environmental & Radiological Health Sciences. Managing and performing research related to understanding the acute health effects of air



pollution in occupational, residential, and controlled settings.

Colorado State University / Postdoctoral Research Fellow

2015 - 2017, Fort Collins, CO

Department of Mechanical Engineering. Research related to developing measurement and data analysis techniques for air pollutants. Including the development of analysis algorithms, data interfaces, and measurement techniques.

Colorado State University / Postdoctoral Research Fellow

2012 - 2015, Fort Collins, CO

Department of Environmental & Radiological Health Sciences. Research investigating novel approaches to mitigating exposure to traffic related air pollution, quantifying differences in acute health markers of air pollution exposure, as well as instrument development, validation and testing.

The University of Hertfordshire / Project Manager

2011 - 2012, Hatfield, UK

Managing various multilateral projects related to the development of air quality and health impact assessment tools with applications at local, regional, national, and global scales. Specific projects included developing modeling tools for city planners, refining and optimizing air quality models for use cases applicable to specific UK government departments, and helping build strategic relationships with international partners.

CNRS - Université Blaisé Pascal / Postdoctoral Researcher

2009 - 2010, Clemont Ferrand, France

Research on the cloud and ice forming potential of bacteria and other biological particles. Work included deploying novel instrumentation and working across academic disciplines to investigate the properties of airborne bioaerosols. Testing included work with facilities designed to simulate ice forming conditions in the upper atmosphere.

Education

The University of Manchester / PhD

2005-2009, Manchester, UK

Atmospheric Science - Measuring the hygroscopic properties and cloud activation of atmospheric aerosols.

The University of Manchester / BSc

2002-2005, Manchester, UK

Physics

Awards & Service

University of Manchester Physics Scholarship.



UK National Environmental Research Council PhD. Scholarship.

NASA - Citizen Science Data Working Group.

Reviewer - Aerosol Science and Technology

Reviewer - Atmospheric Chemistry & Physics.

Reviewer - Atmospheric Environment.

Reviewer - Atmospheric Measurement Techniques.

Reviewer Environmental Health Perspectives.

Reviewer - Indoor Air.

Select Publications

From over 50 peer-reviewed publications ORCiD: 0000-0002-6048-4938

h-index 28

Gibson, L. et al., Measurement Report: An investigation of the spatiotemporal variability of aerosol in the mountainous terrain of the Upper Colorado River Basin from SAIL-Net, EGUsphere [pre-print], 2024.

Hoskovec, L. et al., Infinite hidden Markov models for multiple multivariate time series with missing data, Biometrics, 2023.

Tanner, K. et al., Large particle emissions from human vocalization and playing of wind instruments, Environ. Sci. Tech., 2023.

Benka-Coker, M. et al., Household air pollution from wood-burning cookstoves and C-reactive protein among women in rural Honduras, Int. J. Hyg. Environ. Health., 2022.

Volckens, J. et al., Aerosol emissions from wind instruments: effects of performer age, sex, sound pressure level, and bell covers, Scientific Reports, 2022.

Good, N. et al., Respiratory aerosol emissions from vocalization: age and sex differences are explained by volume and exhaled CO_2 , Environ. Sci. Technol. Lett., 2021.

Walker, E. et al., Acute differences in blood lipids and inflammatory biomarkers following controlled exposures to cookstove air pollution in the STOVES study, Int. J. Environ. Health Res., 2022.

Young, B. et al., Reduced black carbon concentrations following a three-year stepped-wedge randomized trial of the wood-burning Justa cookstove in rural Honduras, Environ. Sci. Tech. Lett., 2022.

Benka-Coker, M. et al., Impact of the wood-burning Justa cookstove on fine particulate matter exposure: A stepped-wedge randomized trial in rural Honduras, Sci. Total Environ., 2021.

Cole-Hunter, T. et al., Short-term differences in cardiac function following controlled exposure to cookstove air pollution: The subclinical tests on volunteers exposed to smoke (STOVES) study, Environ. Int., 2021.

Benka-Coker, M. et al., Kitchen concentrations of fine particulate matter and particle number concentration in households using biomass cookstoves in rural Honduras, Environ. Poll., 2020.

Fedak, K. et al., Acute changes in lung function following controlled exposure to cookstove air pollution in the subclinical tests of volunteers exposed to smoke (STOVES) study, Inhal. Toxicol., 2020.



Walker, E. et al., Acute differences in pulse wave velocity, augmentation index, and central pulse pressure following controlled exposures to cookstove air pollution in the Subclinical Tests of Volunteers Exposed to Smoke (SToVES) study, Environ. Res., 2020.

Walker, E. et al., Exposure to household air pollution from biomass cookstoves and self-reported symptoms among women in rural Honduras, Int. J. Environ. Health Res., 2020.

Bilsback, K. et al., A laboratory assessment of 120 air pollutant emissions from biomass and fossil fuel cookstoves, Environ. Sci. Technol., 2019.

Cole-Hunter T. et al., Acute changes in heart rate variability and cardiac repolarization following controlled exposure to cookstove air pollution: the Subclinical Tests of Volunteers Exposed to Smoke (STOVES) study, Environ. Epi., 2019.

Fedak, K. et al., Acute effects on blood pressure following controlled exposure to cookstove air pollution in the STOVES study, Journal of the American Heart Association, 2019.

Fedak, K. et al., Acute changes in C-reactive protein and lipoproteins following controlled exposures to cookstove air pollution in the Subclinical Tests of Volunteers Exposed to Smoke (SToVES) Study, Environ. Epi., 2019.

Fedak, K. et al., An expert survey on the material types used to start cookstoves, Energy Sustain. Dev., 2019.

Good, N. et al., Development and validation of models to predict personal ventilation rate for air pollution research, J. Expos. Sci. Environ. Epi., 2019.

Greenwald, R. et al., Estimating minute ventilation and air pollution inhaled dose using heart rate, breath frequency, age, sex and forced vital capacity: A pooled-data analysis, PLoS One, 2019.

Koehler, K. et al., The Fort Collins commuter study: Variability in personal exposure to air pollutants by microenvironment, Indoor air, 2019.

Rajkumar, S. et al., Household air pollution from biomass-burning cookstoves and metabolic syndrome, blood lipid concentrations, and waist circumference in Honduran women: A cross-sectional study, Environ. Res., 2019.

Tryner, J. et al., Variation in gravimetric correction factors for nephelometer-derived estimates of personal exposure to PM_{2.5}, Environ. Poll., 2019.

Van Zyl, L. et al., Effects of fuel moisture content on emissions from a rocket-elbow cookstove, Environ. Sci. Technol., 2019.

Young, B. et al., Exposure to household air pollution from biomass cookstoves and blood pressure among women in rural Honduras: a cross-sectional study, Indoor Air, 2019.

Young, B. et al., Study protocol for a stepped-wedge randomized cookstove intervention in rural Honduras: household air pollution and cardiometabolic health, BMC Public Health, 2019.

Benka-Coker, M. et al., Exposure to household air pollution from biomass cookstoves and levels of fractional exhaled nitric oxide (FeNO) among Honduran women, International journal of environmental research and public health, 2018.



Bilsback, K. et al., The Firepower Sweep Test: A novel approach to cookstove laboratory testing, Indoor Air, 2018.

Fedak, K. et al., Chemical composition and emissions factors for cookstove startup (ignition) materials, Environ. Sci. Tech., 2018.

Good, N. et al., An accurate filter loading correction is essential for assessing personal exposure to black carbon using an Aethalometer, Journal of Exposure Sci. & Environ Epi, 2017.

Good, N. et al., The Fort Collins Commuter Study: Impact of route type and transport mode on personal exposure to multiple air pollutants, J. Expos. Sci. Environ. Epi., 2016.

Paramonov, M. et al., A synthesis of cloud condensation nuclei counter (CCNC) measurements within the EUCAARI network, Atmos. Chem. Phys., 2015.

Chemel, C. et al., Application of chemical transport model CMAQ to policy decisions regarding $PM_{2.5}$ in the UK, Atmos. Environ., 2014.

Whitehead, J. et al., A meta-analysis of particle water uptake reconciliation studies, Atmos. Chem. Phys., 2014.

Alfarra, M. et al., Water uptake is independent of the inferred composition of secondary aerosols derived from multiple biogenic VOCs, Atmos. Chem. Phys., 2013.

Alfarra, M.R. et al., The effect of photochemical ageing and initial precursor concentration on the composition and hygroscopic properties of β -caryophyllene secondary organic aerosol, Atmos. Chem. Phys., 2012.

Hamilton, J. et al., Investigating the use of secondary organic aerosol as seed particles in simulation chamber experiments, Atmos. Chem. Phys., 2011.

Massling, A. et al., Results and recommendations from an intercomparison of six Hygroscopicity-TDMA systems, Atmos. Meas. Tech., 2011.

McMeeking, GR. et al., Influences on the fraction of hydrophobic and hydrophilic black carbon in the atmosphere, Atmos. Chem. Phys., 2011.

Good, N. et al., Consistency between parameterisations of aerosol hygroscopicity and CCN activity during the RHaMBLe discovery cruise, Atmos. Chem. Phys., 2010.

Good, N. et al., Instrumentational operation and analytical methodology for the reconciliation of aerosol water uptake under sub-and supersaturated conditions, Atmos. Meas. Tech., 2010.

Good, N. et al., Widening the gap between measurement and modelling of secondary organic aerosol properties?, Atmos. Chem. Phys., 2010.

Irwin, M. et al., Reconciliation of measurements of hygroscopic growth and critical supersaturation of aerosol particles in central Germany, Atmos. Chem. Phys., 2010.

Lee, J.D. et al., Reactive halogens in the marine boundary layer (RHaMBLe): The tropical North Atlantic experiments, AAtmos. Chem. Phys., 2010.

Allan, JD. et al., Composition and properties of atmospheric particles in the eastern Atlantic and impacts on gas phase uptake rates, Atmos. Chem. Phys., 2009.



	Duplissy, J. et al., Intercomparison study of six HTDMAs: results and recommendations, Atmo. Meas. Tech., 2009.
	Good, N. et al., Consistency between parameterisations of aerosol hygroscopicity and CCN activity during the RHaMBLe Discovery cruise, Atmos. Chem. Phys., 2009.
	Meyer, N. et al., Analysis of the hygroscopic and volatile properties of ammonium sulphate seeded and unseeded SOA particles, Atmos. Chem. Phys., 2009.
	Duplissy, J. et al., Cloud forming potential of secondary organic aerosol under near atmospheric conditions, Geophys. Res. Lett., 2008.
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Select Presentations	Gibson, L. et al., The Results of SAIL-Net: Investigating Spatial Variability of Aerosol and Cloud Nuclei in Mountainous Terrain. AGU 2023.
	Hodshire, A. et al., SAIL-NET: Investigating spatial variability of aerosol and cloud nuclei in mountainous terrain, AGU 2022.
	Slater, K. et al., Impact of the wood-burning Justa stove on Fractional Exhaled Nitric Oxide: A stepped-wedge randomized trial in Honduras, ISEE 2022.
	Levin, E. et al., Investigating spatial variability of aerosol and cloud nuclei in mountainous terrain, AGU 2021.
	Benka-Coker, M. et al., Exposure to household air pollution from wood-burning cookstoves and C-reactive protein among women in rural Honduras, ISEE 2020.
	Young, B. et al., Effects of a randomized biomass cookstove intervention on glycated hemoglobin among women in Honduras, ISEE 2020.
	Van Zyl, et al. Effects of Fuel Moisture Content on Biomass Emissions from a Rocket Elbow Cookstove. AAAR 2019
	Walker, ES. et al., Acute Differences in Inflammatory Biomarkers Following Controlled Exposures to Cookstove Air Pollution in the STOVES Study, ISEE 2020.
	Wendt, E. et al., Improvements and Expansion of the Citizen-Enabled Aerosol Measurements for Satellites (CEAMS) Network for High-Resolution Measurements of PM _{2.5} and Aerosol Optical Depth, AGU 2019.
	Young, B. et al., Household Air Pollution and Glycated Hemoglobin among Women in Honduras: Baseline Data from Two Seasons, ISEE 2018.
	Clark, M. et al., Non-Targeted Metabolite Profiling of Dried Blood Spots in a Field-Based Epidemiologic Study of Household Air Pollution, ISEE 2018.
	Walker, E. et al., Acute Changes in Augmentation Index and Pulse Wave Velocity Following Controlled Exposures to Cookstove Air Pollution in the Subclinical Tests of Volunteers Exposed to Smoke (Stoves) Study, ISEE 2018.
	Fedak, K. et al., Acute Changes in Blood Pressure Following Controlled Exposures to Cookstove Air Pollution in the Subclinical Tests of Volunteers Exposed to Smoke (STOVES) Study, ISEE 2018.
	Good, N. et al., Mitigation of Commuter's Air Pollution Exposure Via Personal Choices: Exploring Exposure Metrics, ISEE 2018.



Rajkumar, S. et al., Fine Particulate Matter Exposure from Wood-Burning Cookstoves in Relation to Augmentation Index and Blood Pressure among Honduran Women, ISEE 2018.

Volckens, J. et al., Lessons Learned from the CEAMS Pilot: A Citizen-Science Investigation to Improve Satellite Remote Sensing of Particulate Air Pollution, AGU 2018.

Benka-Coker, M. et al., Exposure to household air pollution from biomass cookstoves and biomarkers of systemic inflammation from dried blood spots among women in rural Honduras, ISEE 2018.

Volckens, J. et al., Citizen-Enabled Aerosol Measurements for Satellites (CEAMS): A Network for High-Resolution Measurements of $PM_{2.5}$ and Aerosol Optical Depth, AGU 2018.

Bilsback, K. et al., Household Cookstoves: A Comprehensive Assessment of Health-Relevant Emissions, ISEE 2017.

Bilsback, K. et al., Closing the Gap between Laboratory and In-Situ Biomass Cookstove Emissions Measurements, ISEE 2017.

Good, N. et al., Commuter's Air Pollution Exposure: Ventilation Rate and Urban Design Are Major Factors in Cyclist's Elevated Intake, AAAR 2017.

Good, N., Commuter's Air Pollution Exposure: Consideration of Ventilation Rate, University of Cincinnati, Invited Talk.

Amato, P. et al., Biological aerosol particles in the atmosphere and their impact on clouds (BIOCLOUDS), EGU 2015

Good, N. et al., Personal Air Pollution Intake: Combining Spatio-temporally Resolved Exposure and Inhalation Metrics, AAAR 2015.

Koehler, K. et al. Multipollutant Analysis of Microenvironmental Exposures, AAAR 2015.

McMeeking, G. et al., Single-particle Fluorescence Measurements for Bioaerosol Exposure Monitoring, AAAR 2015.

Good, N. et al., The Fort Collins Commuter Study: Mitigating commuter exposure to air pollution. How does the choice of route and mode influence exposure?, ISES 2014.

Koehler, K. et al., A Holistic Approach to Microenvironmental Exposure Assessment: Multi-pollutant Analysis of Home, Work, and Commute Personal Exposures. International Aerosol Conference, 2014.

Koehler, K. et al., A holistic approach to microenvironmental exposure assessment: home, work, and commute personal exposures to particulate air pollution, ISEE 2013.

Good, N. et al., Measuring Exposure to Black Carbon in the Context of a Multi-Pollutant Study. AAAR 2013.

Good, N. et al., Commuting and air pollution: A multi-pollutant exposure study, ISEE 2013.

McFiggans, G. et al., Composition and hygroscopicity of real and synthetic marine aerosol, AGU 2011.

Alfarra, MR. et al., Insights into biogenic secondary organic aerosols produced



	from five structurally different precursors, Goldschmidt Conference 2011.
	Irwin, M. et al., Multisite reconciliation of sub-and supersaturated particle water uptake, AGU 2009.
	Allan, JD. et al., Comprehensive Measurements of Aerosols in a Marine Environment and Modelling of Hygroscopicity, Cloud Microphysics and Heterogeneous Processes, AAAR 2009.
	Allan, JD. et al., The Regional Extent of Biogenic Aerosols in Borneo, AGU 2008.
	Hamilton, JF. et al., Aerosol Coupling in the Earths System (ACES): Linking Chemical Composition of Secondary Organic Aerosol to Hygroscopic Properties, AGU 2008.
	Alfarra, M R. et al., Aerosol Coupling in The Earths System (ACES): Chamber studies of the formation and transformation of biogenic secondary organic aerosols, NCAS Conference 2008.
	Massling, A. et al., Comparison of six H-TDMA systems: a laboratory study, EAC, 2007.
	Massling, A. et al., A laboratory comparison of six custom built H-TDMA systems, Nordic Society for Aerosol Research Annual Symposia, 2007.
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Teaching	Occupational and Environmental Toxicology, ERHS 504, Colorado State University, 2020 - present (guest lecturer).
	R Programming for Research, ERHS 535/581A3/531A4, Colorado State University, 2018-2021 (instructor)
	Aerosols and Environmental Health, ERHS 726/MECH581A5, Colorado State University, 2012-2019 (guest lecturer).
	The Theory and Practice of Aerosol Instruments - Summer Workshop Series, Colorado State University and TSI Inc., 2015-2018.
	Reproducible Research With R, Colorado State University, Department of Statistics, 2017 (guest lecturer).
	Personal Aerosol Exposures and Data Analysis in R, Colorado State University, 2016 (workshop).
	Scientific Computing, The University of Hertfordshire, 2011 (instructor).
	Scientific Problem Solving, EART10160, University of Manchester, 2007-2008 (teaching assistant).
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Recent Funding	Indoor Air Quality Assessment and Mitigation Strategies for Colorado Businesses. HHS-CDC. 2024-2026. Role: Co-Investigator. Amount: \$827,666.
	A Low-Cost, Networkable Fluorescence Spectrometer for Automatic Identification of Pollen and Other Coarse Mode Aerosols Found in Urban Environments. Department of Energy (DOE), 2024. Role: Principal Investigator. Amount: \$255,417.



A Low-Cost Holographic Sensor for Urban Aerosol Characterization. Department of Energy (DOE), 2023-2025. Role: Co-Investigator Amount: \$1.65M.

The influence of air pollution exposure on cognitive decline, cognitive impairment, and dementia risk in middle-aged and older adults. Center for Healthy Aging, 2023-2024. Role: Co-Investigator. Amount \$50,000.

The Airborne Multiangle Aerosol Size Spectrometer: A Next Generation Aerosol Probe. National Aeronautics and Space Administration (NASA), 2023-2024. Role: Co-Investigator. Amount: \$165,519.

A Low-Cost Holographic Sensor for Urban Aerosol Characterization. Department of Energy (DOE), 2023. Role: Co-Investigator. Amount: \$256,500.

Portable Holographic Imager for Aerosols (PHIA), Department of Defense (DoD), 2023. Role: Co-Investigator. Amount: \$182,995.

AerFox: An Adaptive, Agile Modular System for Global Aerosol and Trace Gas Measurements. Department of Energy (DOE), 2022-2023. Role: Sub-Awardee. Amount: \$250,000.

COVID-19: Indoor Air Quality/Ventilation Assessment and Improvement Grant Program. HHS-CDC. 2021-2024. Role: Co-Principal Investigator. Amount: \$2,128,597.

Quantitative Models to Reduce Exposures to Aerosols and Respiratory Droplets in the Performing Arts, CSU OVPR, 2020. Role: Principal Investigator. Amount: \$32,137.

Precision spatio-temporal exposure assessment for indoor work environments. CDC NIOSH Mountain & Plains ERC, 2019-2020. Role: Principal Investigator. Amount: \$15,000.

