



Yafang Guo, PhD

Air Quality Emissions Modeler

Dr. Guo joined Sonoma Technology in 2024. She has several years of research experience in atmospheric science, with specialized expertise in air quality and assessing aerosol-cloud interactions using numerical models. As a member of the Atmospheric and Emissions Modeling Group, she conducts emissions assessments, performs comprehensive air quality model simulations, and uses dispersion modeling and advanced photochemical models to assess pollutant fate and transport. Her role

includes the evaluation and validation of these models, ensuring their accuracy and reliability through rigorous data analysis. Additionally, she also interprets model results and contributes to transforming complex data sets into insightful visualizations. Dr. Guo is also currently supporting multiple litigation and air quality research projects. Dr. Guo's technical skills include air quality modeling, surface and in-situ observations, and analysis of remote sensing data gathered from LIDAR and satellites. She is proficient in programming languages such as Python and MATLAB for data analysis and visualization.

Education

- PhD, Engineering Physics, Embry-Riddle Aeronautical University
- BE, Electrical Engineering, Wuhan University

Before joining Sonoma Technology, Dr. Guo served as a Research Scientist III in the Modeling and Analysis of Atmospheric Composition Laboratory at the University of Arizona. Her research concentrated on air quality modeling, with a focus on ozone pollution, aerosol extreme events, and aerosol-cloud interactions. For this work, she used WRF-Chem, CAM-Chem, and the photochemical model CMAQ. Dr. Guo developed a tagging system within the WRF-Chem model to attribute ozone pollution to various emission sources, including anthropogenic, biomass burning, and biogenic emissions. Her work included investigating the impact of wildfire smoke plumes on urban air quality, specifically how smoke exacerbates ozone and PM_{2.5} concentrations during wildfire seasons. Additionally, she explored aerosol-cloud interactions during deep convection, examining aspects such as convective initialization, radiative budget, and precipitation using WRF/WRF-Chem models with different physical and aerosol parameterization schemes. Her research experience also included analyzing the characteristics of extreme aerosol events in response to emission reductions over the past two decades through numerical simulations.

Dr. Guo earned her PhD in Engineering Physics from Embry-Riddle Aeronautical University, where her dissertation focused on characteristics of gravity wave and turbulence, and effects of their vertical transport using LIDAR remote sensing observations. She then held postdoctoral positions at Cornell University and the University of North Dakota, where she further developed her expertise in atmospheric modeling with a focus on air quality and aerosol-cloud interactions. At the University of Arizona, Dr. Guo continued to advance her work in air quality modeling, working with the Arizona Department of Environmental Quality to improve understanding of ozone pollution in the state.