



Andrea F. Anderson, PhD

Air Quality Data Scientist



Dr. Anderson joined Sonoma Technology's Data Science Department in 2022. She has over 10 years of combined professional and academic experience in the environmental sector with an emphasis in atmospheric chemistry and is passionate about addressing air pollution policy issues. Dr. Anderson uses her atmospheric chemistry expertise and experience with statistical programs on ground, satellite, and model data to develop a better understanding of emissions, local sources, and regional impacts from events such as wildfires.

At Sonoma Technology, Dr. Anderson works routinely with industrial fence-line monitoring networks, which include point monitors and open-path technology. She additionally has direct experience with low-cost sensor networks, including data validation of PurpleAir sensor data for air quality models using Python, R, and AWS cloud computing. Dr. Anderson regularly conducts and authors literature reviews across air quality topics, which in the past year included mobile ammonia emissions and methane emissions from the oil and gas supply chain.

Before joining Sonoma Technology, Dr. Anderson completed her PhD in Atmospheric Chemistry at the University of California, Irvine, with Dr. Barbara Finlayson-Pitts. In this work, she characterized atmospheric fates of emerging contaminants using a suite of atmospheric monitoring techniques, such as Fourier-transform infrared (FTIR) and UV spectroscopy, mass spectrometry, chromatography, and photochemical sensors.

In tandem with her PhD, Dr. Anderson was a participant in a four-year National Science Foundation (NSF) research traineeship (NRT), which trains researchers to connect their scientific research outside the laboratory to impact community groups. During this traineeship, Dr. Anderson developed a research project with the California Air Resources Board's (CARB) Atmospheric Processes Research Section to analyze how wildfire emissions were influencing ozone pollution, formation mechanisms, and attainment across the state. Dr. Anderson used the California ground-based air quality monitor network data to monitor wildfire impacts on CO, NO₂, PM_{2.5}, PM₁₀, and O₃. She gained further insights into the ground-based monitor data by comparison with satellite-retrieved total column volatile organic compound (VOC) and nitrogen oxides (NO_x) data, and conducted technical analysis of the wildfire impacts using statistical analysis and visualization in R of the ground-based and satellite monitor data. These results were disseminated to CARB's interdivisional forestry management group, as well as published in peer-reviewed literature and her doctoral thesis.

Dr. Anderson originally hails from the Chicagoland area, where she completed her BS degree in 2011 and subsequently worked in the environment, health, and safety (EHS) field. From 2011-2017 she held laboratory positions specializing in method development for air and water pollutants using chromatography and mass spectrometry techniques (GC, LC, and UPLC systems with PID, MS, and MS/MS detectors). She additionally held an EHS program management role with a 28-country territory, where she travelled extensively while working with an international team supporting EHS compliance in her region.

Education

- PhD, Atmospheric Chemistry, University of California, Irvine
- BS, Chemistry, Dominican University, River Forest, IL

Memberships

- American Geophysical Union
- American Chemical Society