



Isaac K. Afreh, PhD

Air Quality Modeler

Dr. Afreh joined Sonoma Technology in 2021. As an air quality modeler, he assists with emissions and air quality modeling assessments, as well as environmental data analysis projects that support community air quality and climate projects. He conducts technical analyses using advanced emissions and air quality models to address complex environmental problems and meet the research, regulatory, and litigation support needs of clients. He is also responsible for developing, processing, and assessing

emissions inventories to support regional-scale and near-field air quality assessments. In addition, he visualizes, analyzes, and interprets model data while applying statistical methods to compare model results with observation data. Dr. Afreh prepares technical reports and communicates results to clients and other scientific researchers, all while working with interdisciplinary teams in a collaborative applied research environment.

Dr. Afreh's recent work includes supporting air quality analyses for transportation projects under the National Environmental Protection Act (NEPA). Dr. Afreh is using the AERMOD dispersion model to support a PM hot-spot analysis for the Colorado Department of Transportation's I-270 project. Dr. Afreh is also facilitating hands-on webinar training sessions to support California Department of Transportation (Caltrans) District staff in conducting project-level air quality assessments.

Prior to joining Sonoma Technology, Dr. Afreh developed a database for a wildfire emissions inventory as a Graduate Research Assistant at University of California, Riverside. He also generated chemical mechanisms for biogenic compounds and simulated their formation potentials. In addition, he used GECKO-A to develop air quality model surrogates for monoterpenes to improve secondary organic aerosol (SOA) predictions and assisted in updating the rate constants of organic compounds in SAPRC-18 mechanism development.

Dr. Afreh participated in the 2020 Air Quality Modeling Training Workshop in Mexico City where he learned how to use WRF-Chem for regional-scale air quality modeling. He also has extensive experience in SAPRC, Python, Fortran, MATLAB, MS Office, and Linux.

Education

- PhD, Chemical & Environmental Engineering, University of California-Riverside
- Professional Course, Air Quality Permitting & Compliance, University of California-Irvine
- MS, Chemical Engineering, The University of Akron
- BS, Chemical Engineering, Kwame Nkrumah University of Science and Technology

Memberships

- American Institute of Chemical Engineers
- American Association for Aerosol Research
- Air & Waste Management Association
- Golden Key International Honour Society