



Tyler M. Fenske

Air Quality Data Scientist



Mr. Fenske joined Sonoma Technology in 2023 as an Air Quality Data Scientist. He uses his knowledge of atmospheric sciences and climate change, along with his Python programming and data analysis and visualization skills, to contribute to fire weather forecasting and air pollution exposure projects. Mr. Fenske is based in Houston, Texas.

Mr. Fenske uses his data science and meteorological expertise to support a variety of projects for government, non-profit, and industry clients that involve data analysis, processing, and management. He is working on evaluating the Unified Forecast System Subseasonal Model for fire weather metrics as part of a National Oceanic and Atmospheric Administration (NOAA) grant project. For this project, he uses Python and his experience with time series statistics to develop and apply a harmonics time-series tool that can compute accurate climatologies for geospatial data over relatively short time periods. He also contributes to this project's data visualization efforts by using Jupyter notebooks and Python packages, such as matplotlib, seaborn, and cartopy, for plotting figures.

He is also working on the University of California San Francisco Wildfire Smoke and Birth Defects study, where he uses ArcGIS and Python to perform various data transformations such as grid downscaling, extracting raster data at specified points, and data management and analysis. In particular, he uses the Python pandas package to handle large data tables, such as smoke and traffic exposure measurements. He has also used many of these same tools and skills to assist with a low-cost sensor project for the Electric Power Research Institute (EPRI) that analyzes data from thousands of consumer-grade PurpleAir air quality sensors. Additionally, he assists with data quality assurance and analysis for the refinery monitoring program. For this work, he uses Sonoma Technology's Insight Data Management web interface, as well as the Microsoft Office suite, to perform daily checks on air quality data near refineries.

Prior to joining Sonoma Technology, Mr. Fenske completed his Master's degree in Atmospheric Science from the University of Miami. Mr. Fenske's research focused on low-frequency climate variability, particularly the Pacific Decadal Oscillation (PDO) and Atlantic Multidecadal Variability (AMV), and how these two climate features interact with each other. He found that the North Atlantic and North Pacific Ocean basins do not interact directly with each other, and that global warming affects each ocean in very similar ways and serves as a confounding factor that caused prior studies to conclude that the two oceans were climatically connected. During graduate school, he was a member of several student-led committees and organizations that focused on professional development. In 2021 and 2022, he was a Co-Chair of the American Meteorological Society (AMS) Student Conference Planning Committee. He is currently a member of the American Geophysical Union (AGU) Early Career Committee for the Atmospheric Sciences section.

Mr. Fenske has presented research at more than one dozen scientific conferences, including AMS Annual Meetings from 2017 through 2022, and the AGU Fall Meeting in 2022. He is a seasoned programmer with a background in mathematics and computer science, and has over 7 years of experience using Python. He also has experience with other programming languages such as IDL, Matlab, C++, Java, and LaTeX. He has worked with big data, parallel processing, climate modelling (CMIP 5 & 6), weather radar data (NEXRAD), and weather forecast data (HRRR, NAM, NMME, and GFS), and enjoys data visualization and statistics.

Education

- MS, Atmospheric Science, University of Miami
- BS, Meteorology, Texas A&M University

Memberships

- American Geophysical Union (AGU)
- American Meteorological Society (AMS)