



CHEMISTRY SEMINAR 291

Airborne Measurements and Air Quality Impacts of the 2016 California Soberanes Wildfire

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Date: 4/19/19
Time: 1:30 PM
Location: COB1 267

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ABSTRACT

Biomass burning, which includes wildfires, prescribed, and agricultural fires, is an important source of trace gases and particles, and can influence air quality on a local, regional, and global scale. With the threat of wildfire events increasing due to changes in land use, increasing population, and climate change, the importance of characterizing wildfire emissions is vital. The Soberanes Fire began from an illegal campfire on 22 July 2016 in the Garrapata State Park in Monterey County, California. Over the following three months the fire burned a total of 132,127 acres. Presented here are aircraft measurements of carbon dioxide (CO₂), methane (CH₄), ozone (O₃), and formaldehyde (HCHO) from five flights near and downwind of the Soberanes wildfire, collected as part of the Alpha Jet Atmospheric eXperiment (AJAX). In situ data are used to determine enhancement ratios (ERs), or excess mixing ratio relative to CO₂, as well as assess O₃ production from the fire. Downwind air quality impacts are assessed using both measured and modeled data. This includes ground-based monitoring site data, satellite smoke products, and the Community Multiscale Air Quality (CMAQ) photochemical grid model.

BIO:

Dr. Marrero is an Air Quality Scientist and Team Leader at Sonoma Technology, Inc. (STI). She has nearly a decade of experience in conducting field measurements of atmospheric species relevant to air quality, global climate, and human health. Before joining STI, Dr. Marrero was a Research Assistant at UC Irvine, where she received her PhD in chemistry. Her thesis focused on emissions of volatile organic compounds (VOCs) from unconventional oil and natural gas production infrastructure in North America. Dr. Marrero then became a NASA Postdoctoral Program Research Fellow at the NASA Ames Research Center in California's Silicon Valley, where she worked on a team to conduct regular research flights throughout California and Nevada to measure atmospheric trace gases. She currently continues her data analysis work at NASA Ames through an appointment with the Bay Area Environmental Research Institute.

