

An Analysis of Effects of Woolsey Wildfire on UCLA University Village Air Quality using Low-cost Sensors

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Abstract

The impacts of major gaseous and particulate pollutants emitted by the wildfire of November 2018 on ambient air quality of UCLA University Village which is 20 miles southeast of the fire before, during, and after the fire are analyzed using data available from the PurpleAir Air Quality Monitoring Network and Meteorological Station. It was found that both fine particulate matter (PM smaller than 2.5 μm in diameter [PM_{2.5}]) and inhalable (PM smaller than 10 μm in diameter [PM₁₀]) levels exceeded the federal daily 24-hour average standard during the fire and the elevation of the outdoor PM levels in our target community has a 2-3 days lag. The wind directions as well as the traffic from freeway 405 are two important factors of the outdoor air pollutions. And during the fire, it is found that there was a significant change of the wind direction during the wildfire, while the outdoor air quality has a daily rhythmic change due to the traffic from the freeway as well. The study shows that the use of HVAC system effectively decreased PM concentration. On the basis of the findings, it is recommended that communities engage in pre-event planning and purification measures that would minimize the indoor impacts as a result of a large wildfire. It is also advised that appropriate agencies engage in the use of all available meteorological forecasting resources, including real-time satellite imaging assets, to accurately forecast air quality and assist firefighting efforts.

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