

GROUND LEVEL CHEMICAL ANALYSIS OF AIR TRANSPORTED FROM THE 1998 MEXICAN-CENTRAL AMERICAN FIRES TO THE SOUTHWESTERN USA

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Key words: biomass, fires, air quality, transport, stratosphere

ABSTRACT

In May 1998, a large number of forest fires in the region of southern México and Central America, released huge amounts of contaminants that were transported over the Pacific Ocean; then, due to a change in air current direction, the primary contaminants and their secondary pollutant products impacted central New Mexico after 5 to 6 days transport time. The total distance traveled was approximately 3000 km from the fire source. Background measurements of a number of key chemical markers were taken before and during the haze incursion at a site located at Socorro, NM. A number of days before the haze episode in NM, large areas of Texas, Louisiana and the lower Mississippi River valley were also inundated by smoke from the fires. The sum of carbonyl compounds was 5.6 ppbv before and 15.5 ppbv during the smoke event; the sum of carboxylic acids went from 7.2 ppbv to 8.6 ppbv; C1-C2 hydrocarbons went from 270 ppbv to 133 ppbv; particulate NO₃ went from 0.1 to 1.3 µg m⁻³; SO₄²⁻ went from 1.2 to 3.4 µg m⁻³; and PM₁₀ concentrations remained between the range measured before the episode (15-20 µg m⁻³). The results indicate the significant impact on a rural site from long range transport of primary and secondary smoke pollutants from biomass burning events and the importance of these species being primarily in the gaseous and fine aerosol size range. These fine aerosols are important as climate forcing agents and in reducing air quality and visibility.

Palabras clave: biomasa, fuegos, calidad del aire, transporte, estratósfera

RESUMEN

En mayo de 1998, varios incendios forestales en la región sur de México y en América Central, emitieron enormes cantidades de contaminantes que fueron transportados al