

**COMPARISON OF PM<sub>2.5</sub> CHEMICAL COMPOSITION FROM THE FRESNO SUPERSITE  
DURING WINTERTIME POLLUTION  
EPISODES IN CENTRAL CALIFORNIA**

**J.C. Chow, J.G. Watson, L.W.A. Chen**

*Division of Atmospheric Sciences, Desert Research Institute, Reno, USA*

Five PM<sub>2.5</sub> samples per day were taken at two urban (Fresno and Bakersfield), one non-urban (Angiola), one foothill (Auberry), and one boundary (Bethel Island) sites for fifteen days during five episodes in California's San Joaquin Valley. These were chemically characterized for mass, elements, ions, and carbon fractions. Urban sites show large carbon concentrations relative to the non-urban and boundary sites. The elevated foothill location showed lower concentrations than at the other sites except for cases when the valley-wide layer deepened. Ammonium nitrate concentrations were higher at the rural Angiola site than at Fresno on some occasions. Temporal and spatial variations were explainable in terms of a shallow surface layer forming at night that coupled to the valleywide layer during the afternoon. Continuous nitrate measurements atop a tall tower at Angiola show substantial nitrate aloft with low NO levels, indicating potential for nighttime formation of nitric acid that combines with ammonia to create ammonium nitrate. Continuous nitrate measurements at the Fresno supersite show a sharp increase in nitrate concentrations between 1000 and 1200 PST when solar-induced vertical mixing commences. Continuous carbon measurements at the Fresno supersite confirm the morning traffic peak. Carbon also rises throughout the evening at Fresno, consistent with contributions from home heating on cold winter nights.