

Home

Online Library ACP

- Recent Final Revised Papers
- Volumes and Issues**
- Special Issues
- Library Search
- Title and Author Search

Online Library ACPD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper



[Volumes and Issues](#) [Contents of Issue 7](#)

Atmos. Chem. Phys., 7, 1741-1754, 2007  
www.atmos-chem-phys.net/7/1741/2007/

© Author(s) 2007. This work is licensed under a Creative Commons License.

## Evaluation of organic markers for chemical mass balance source apportionment at the Fresno Supersite

J. C. Chow<sup>1</sup>, J. G. Watson<sup>1</sup>, D. H. Lowenthal<sup>1</sup>, L. W. A. Chen<sup>1</sup>, B. Zielinska<sup>1</sup>, L. R. Mazzoleni<sup>2</sup>, and K. L. Magliano<sup>3</sup>

<sup>1</sup>Desert Research Institute, Reno, NV, USA

<sup>2</sup>Colorado State University, Fort Collins, CO, USA

<sup>3</sup>California Air Resources Board, Sacramento, CA, USA

**Abstract.** Sources of PM<sub>2.5</sub> at the Fresno Supersite during high PM<sub>2.5</sub> episodes occurring from 15 December 2000–3 February 2001 were estimated with the Chemical Mass Balance (CMB) receptor model. The ability of source profiles with organic markers to distinguish motor vehicle, residential wood combustion (RWC), and cooking emissions was evaluated with simulated data. Organics improved the distinction between gasoline and diesel vehicle emissions and allowed a more precise estimate of the cooking source contribution. Sensitivity tests using average ambient concentrations showed that the gasoline vehicle contribution was not resolved without organics. Organics were not required to estimate hardwood contributions. The most important RWC marker was the water-soluble potassium ion. The estimated cooking contribution did not depend on cholesterol because its concentrations were below the detection limit in most samples. Winter time source contributions were estimated by applying the CMB model to individual and average sample concentrations. RWC was the largest source, contributing 29–31% of measured PM<sub>2.5</sub>. Hardwood and softwood combustion accounted for 16–17% and 12–15%, respectively. Secondary ammonium nitrate and motor vehicle emissions accounted for 31–33% and 9–15%, respectively. The gasoline vehicle contribution (3–10%) was comparable to the diesel vehicle contribution (5–6%). The cooking contribution was 5–19% of PM<sub>2.5</sub>. Fresno source apportionment results were consistent with those estimated in previous studies.

[Final Revised Paper](#) (PDF, 387 KB) [Discussion Paper](#) (ACPD)

Citation: Chow, J. C., Watson, J. G., Lowenthal, D. H., Chen, L. W. A., Zielinska, B., Mazzoleni, L. R., and Magliano, K. L.: Evaluation of organic markers for chemical mass balance source apportionment at the Fresno Supersite, Atmos. Chem. Phys., 7, 1741-1754, 2007. [Bibtex](#) [EndNote](#) [Reference Manager](#)

Search ACP

Library Search

Author Search

News

- Sister Journals AMT & GMD
- Financial Support for Authors
- Journal Impact Factor
- Public Relations & Background Information

Recent Papers

01 | ACP, 19 Feb 2009:  
Increasing ozone in marine boundary layer inflow at the west coasts of North America and Europe

02 | ACP, 18 Feb 2009:  
Monte Carlo simulations of two-component drop growth by stochastic coalescence

03 | ACP, 18 Feb 2009:  
Laboratory investigation of photochemical oxidation of organic aerosol from wood fires 1: measurement and simulation of organic aerosol evolution