

PM_{2.5} light absorbing carbon concentrations and filter-based light absorption measurements from major monitoring networks in the United States.

Jenny L. Hand^{1,*}, Bret A. Schichtel², Warren White³, William C. Malm¹

¹CIRA, Colorado State University, Fort Collins, CO 80523

²National Park Service, Air Resource Division, CIRA, Colorado State University, Fort Collins, CO 80523

³Crocker Nuclear Laboratory, University of California, Davis, CA 95616

*Presenting author (jlhand@colostate.edu)

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Abstract

The rural IMPROVE network (Interagency Monitoring of Protected Visual Environments) and the Environmental Protection Agency's Chemical Speciation Network (CSN) are two long-term monitoring networks that are responsible for measuring speciated PM_{2.5} aerosol composition around the United States. The IMPROVE network operates about 170 mostly remote and rural sites while the CSN operates more than 200 primarily urban and suburban locations. Both networks collect 24-h samples every third day. Currently both networks use nearly identical sample collection and thermal optical reflectance analysis methods for measuring PM_{2.5} organic carbon (OC) and light absorbing carbon (LAC). However, prior to 2008 different monitors and thermal optical analysis methods were used, resulting in biases between the two measurements that required data reconciliation. The IMPROVE network also measures filter-based light absorption using a hybrid integrating plate method. The integration of LAC data from both networks provides for extensive spatial coverage of the United States with which investigations into seasonal and spatial patterns, temporal trends, and urban impacts of LAC sources on rural areas are examined.