

## Evaluation of BlueSky Smoke Dispersion Modeling Framework Using Data from Wildfire Events in California

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Overview of the work: The BlueSky Smoke Modeling Framework integrates meteorology, emissions, dispersion and trajectory models to predict smoke trajectories and particle concentration distribution. Evaluation efforts have been limited and focused mainly on small fires in the Northwest. In this JFSP supported research, we evaluated BlueSky Smoke Modeling Framework using data from the two major wildfire events in California. The first event occurred during the second half of August 2006 when a series of major wildland fires broke out near the border between California and Oregon. The second event is the October 2007 Southern California Wildfire outbreaks that caused the largest evacuation in California history. Meteorological observations, surface PM concentrations, and satellite smoke plume images were collected for the two events and the BlueSky model was run for two week period during the two events. The comparisons of the BlueSky output with the extensive data set provide insight into the accuracy of the BlueSky predictions of smoke plumes and surface concentrations in regions of highly complex terrain. Results show that BlueSky can predict the trajectories and aerial coverage of the smoke plumes reasonably well. The timing and magnitude of predicted increase in surface PM<sub>2.5</sub> concentrations are comparable to the observed at most locations, but BlueSky fail to capture all of the observed increases in surface concentration. The study points to a need to improve quantitative prediction of surface concentration.

Progress: Lesley presented this work at several conferences and the work from the northern California fire and southern California fire events have appeared separately in conference proceedings. The research also forms the basis for Lesley's MS thesis that is available from Michigan State University.

Current Process: We are in the process of finalizing an article about the big southern California fire case which will be submitted to a peer-reviewed journal before the end of April.