

**SEAN M. RAFFUSE**

Project Manager/Fire Sciences Program Coordinator/  
Senior Air Quality Analyst

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**Educational Background**

M.S., Environmental Engineering, Washington University  
B.S., Chemical Engineering, Washington University  
B.A., Chemistry, Lewis & Clark College

1455 N. McDowell Blvd., Suite D  
Petaluma, CA 94954-6503  
707.665.9900  
Fax: 707.665.9800  
[www.sonomatech.com](http://www.sonomatech.com)

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**Professional Experience**

Mr. Raffuse joined STI in 2003 and coordinates STI's Fire Sciences Program. His efforts focus on developing and improving fire and smoke models through the use of new data sets, research, and information systems.

Mr. Raffuse is coordinating several software and systems development projects in fire science applications: development of a service-based version of the BlueSky framework and an accompanying web visualization system; re-architecture of the Fuels Characterization and Classification System; and the design of an Interagency Fuels Treatment Decision Support System for forest managers. Mr. Raffuse has recently used satellite-derived information to evaluate and improve the BlueSky Smoke Modeling Framework developed by the U.S. Forest Service. He designed the Satellite Mapping Automatic Reanalysis Tool for Fire Incident Reconciliation (SMARTFIRE) algorithms. SMARTFIRE combines satellite-detected fire information and ground-based fire reports and reconciles them into a unified data set for input to BlueSky. Mr. Raffuse applied SMARTFIRE to produce a four-year wildfire emission inventory for the U.S. Environmental Protection Agency (EPA). Mr. Raffuse is also using CALIPSO aerosol vertical profiles and MISR plume height retrievals to improve the BlueSky plume injection height algorithms. Mr. Raffuse has also used aerosol optical depth and other satellite-derived data sets to validate the BlueSky model output.

As an air quality analyst, Mr. Raffuse focuses on creating and applying geospatial analysis techniques, developing web-based and desktop geographic information system (GIS) tools, and discovering ways to apply satellite data to air quality applications. Mr. Raffuse has authored several technical publications including a guidance document for EPA to assess air quality monitoring networks using statistical and geospatial techniques. He applied geostatistical analyses to study spatial correlations between fine particulate matter concentrations from EPA's AIRNow system and visibility measurements from the ASOS network, and developed an algorithm to determine the representative extent of meteorological measurements for the California Regional PM<sub>2.5</sub>/PM<sub>10</sub> Air Quality Study (CRPAQS).

Mr. Raffuse has been involved with the design and development of several analytical software tools, including the Probability of Regional Source Contribution of Haze (PORSCH) suite, which couples air mass backward trajectories with emission inventory data to help determine the causes of regional haze; an algorithm for incorporating the influence of wind direction frequency into a model of exposure to pollutants from roadways; and the AIRNow-Tech Navigator, a web-based GIS tool that displays hourly pollutant, wildfire, and meteorological information collected from the EPA's AIRNow program in an interactive geographic context in near real time.

Before joining STI, Mr. Raffuse developed techniques to automatically retrieve and process daily surface reflectance data using satellite imagery from the Sea-viewing Wide Field-of-view Sensor (SeaWiFS) as a graduate research assistant at the Center for Air Pollution Impact and Trend Analysis (CAPITA) at Washington University.

**Memberships**

Air and Waste Management Association  
Association of Fire Ecology  
International Association of Wildland Fire  
American Geophysical Union

See STI's website, <http://www.sonomatech.com/resumes.htm>, for a list of publications.