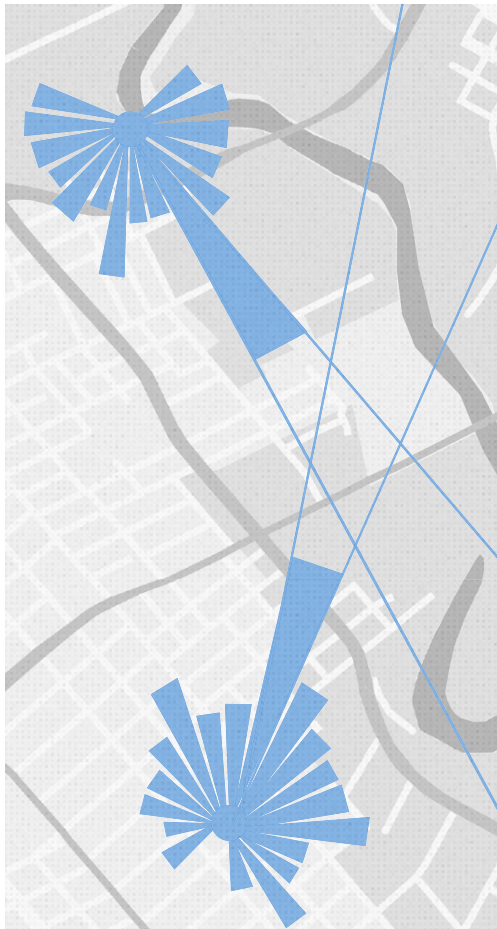


Air Quality Management Services



Source Apportionment Support Services

Providing Innovative Solutions for Complex Problems



Air quality management is a complex process that requires continuous assessment and control strategy planning towards achieving ever-evolving air quality objectives. Achieving clean air through well-planned studies requires appropriate instrumentation and measurement techniques, performing detailed data analysis, and understanding the airshed's characteristic meteorological and geographical parameters, to name a few.

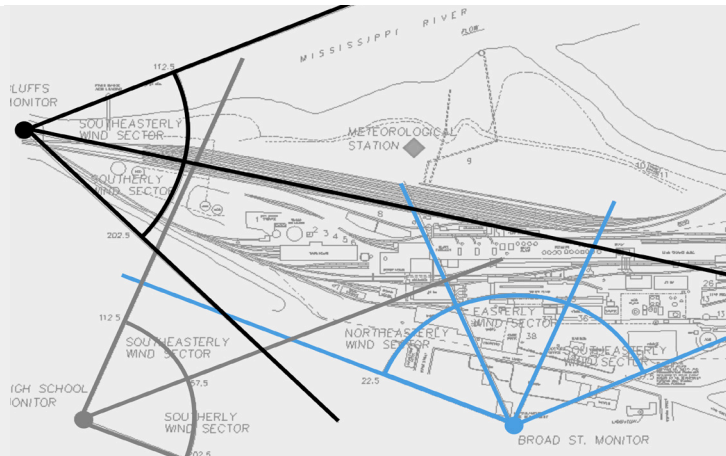
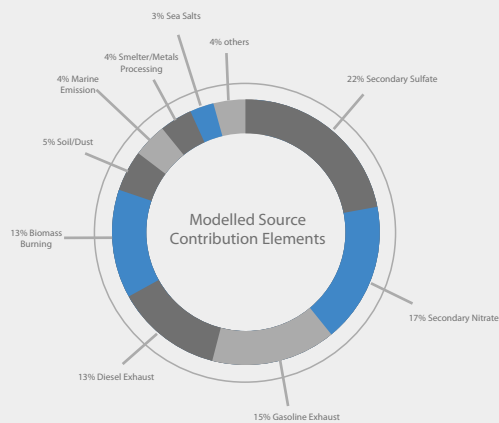
A variety of multivariate and regression analysis techniques have been utilized by researchers for apportioning ambient pollutants to modeled sources, such as Positive Matrix Factorization (PMF), Chemical Mass Balance (CMB), US-EPA's UNMIX, Absolute Principal Component Analysis (APCA), etc. These types of source apportionment models enable identification of sources impacting the receptor sites. The efficacy of control strategies can be gauged based on trends in model-defined source contributions.

A network of monitoring sites provides a comprehensive understanding of intra-urban variability of ambient pollutants as well as the modeled source contributions. Highly time resolved ambient measurements allow capture of the finer details of source impacts and can be used for identifying source locations that lead to high concentrations at receptor sites. A thorough understanding of such issues enables the control and monitoring strategies required for modulating the air quality.

Cooper Environmental Services (CES) has the technical expertise to provide support services for all aspects of source apportionment-based air quality management.

Cooper Environmental Services Capabilities

- Source Apportionment Modeling
- Network Data Assessment
- Ambient Measurements
- Source Profile Development
- Instrumentation Development
- Data Quality Assessment
- Bi/Multivariate Analysis
- Source Impact and Trends Analysis
- Source Location Identification
- Study Design
- Regulatory Compliance Reporting
- Control and Monitoring Strategies
- Technical Reporting



Source Apportionment Modeling

CES performs source apportionment modeling for identifying source types and their contributions based on strong scientific principles. A variety of multivariate methods are also utilized to develop weight-of-evidence in support of source apportionment results.

Network Data Analysis

CES provides innovative solutions for examining ambient monitoring networks datasets. The statistical and graphical tools used by CES enable gauging the spatiotemporal variability of pollutants and allow identification of source locations.

Ambient & Source Measurements

CES has developed highly time resolved, multi-metal measurement techniques with high accuracy for characterization of ambient concentrations and source emissions. CES' Xact instruments have also been recognized by US-EPA's Clean Air Excellence Award.

Why Cooper Environmental Services?

CES scientists have over 40 years of combined experience in the field of air quality management. We offer a complete set of services for receptor modeling studies including study design, ambient and source sampling, source apportionment modeling, source profile library development, network data assessment, control strategies development, training, and hardware/software development. CES researchers have made major contributions to the development and application of source apportionment modeling and pioneered the use of receptor modelling methods for support of control strategies ranging from federal to state implementation plans. Additionally, CES has also provided Chemical Mass Balance (CMB) training to the US-EPA staff. CES' continuing air quality research in instrumentation, source characterization, air quality regulations, receptor modeling, statistical and graphical software assure the most innovative and contemporary approach to air quality data assessment.

Selected Source Apportionment Studies

Boise, ID, USA
 Dearborn, MI, USA
 Des Moines, IA, USA
 Fairbanks, AK, USA
 Hong Kong, China
 Los Angeles, CA, USA
 Minneapolis, MN, USA
 Missoula, MT, USA
 Montreal, Canada
 Portland, OR, USA
 San Diego, CA, USA
 San Paulo, Brazil
 Seattle, WA, USA
 St. Louis, MO, USA
 Salt Lake City, UT, USA
 Toronto, Canada
 Vancouver, Canada

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