

9th Annual CMAS Conference
October 11-13, 2010

Session 1: Air Quality Science: An Essential Ingredient for Successful Air Pollution Health Studies (Special Session)

Understanding the health effects associated with air pollutants requires a detailed characterization of these pollutants in time and space, both in relation to sources and in ambient air. In earlier years, epidemiological studies focused primarily on examining correlations between air pollution measured at central site monitors and health outcomes. More recently, however, epidemiologists have begun to focus on the differences in exposures and health risks associated with intra-urban gradients in air pollutant concentrations, and on differential exposures to air pollution mixtures that arise due to transport and mixing of air pollution from a variety of sources (e.g., industry, traffic, and regionally transported pollution). The resulting requirements for highly resolved characterizations of pollutant mixtures are being met through increased use of air quality models. Health scientists conducting exposure/risk assessments and epidemiological studies are actively pursuing the use of model predictions to augment or replace ambient measurements. Regulatory assessments are increasingly being expected to identify susceptible populations that are vulnerable to pollutant exposures and to guide the development of source controls that will achieve greater risk reductions and health benefits.

These needs offer opportunities for using air quality models to forge a closer connection between air quality science and environmental health sciences. However, such uses create new challenges when applying modeling capabilities that the modeling community must understand and address with future research and development activities. Likewise, the health research community needs to understand important facets of such modeling, including the important differences between (1) statistical models based on observational air pollution data (e.g., land use regression) and (2) dispersion or chemistry-transport models such as AERMOD and CMAQ. This session is intended to promote dialogue between atmospheric and health scientists to improve our understanding of the modeling needs for various types of health studies, and of what models are available or need to be developed to meet these needs. Invited speakers will provide background information along with examples of various health studies and of how they use modeling and related techniques. We seek abstracts that illustrate examples of these studies, particularly those that have identified issues and compared approaches to inform the community of best practices and future developments needed in this important area of environmental research.

Session 2: Model Development

Work in recent years has vastly improved the science of air quality and methodologies for modeling and analyzing the distribution of air pollutants at various temporal and spatial scales. Such advances were motivated by the results from the multitude of applications and evaluations of air quality models that addressed various research, development and regulatory modeling issues. We seek abstracts that illustrate innovative methodologies and process algorithms in air quality modeling. This Session topics include (but are not limited to):

- Indirect radiative effect of aerosols
- Adjoint modeling

- Direct Decoupled Method (DDM)
- Variable and adaptive grids
- Hybrid modeling approaches
- Coupled meteorology/chemistry modeling
- Downscaling and data assimilation and nudging
- Hemispheric chemistry-transport modeling
- Meteorological processes
- Dust models

Session 3: Policy and Decision Support

Air quality models have become indispensable tools in air quality management. This session will focus on research towards science-based policy and applications of models as decision support tools. The session will cover various applications that would inform the decision-making process for air quality improvement. Work that integrates air quality science and modeling with other relevant disciplines such as policy, economics, health, or climate science, and with models used in those disciplines, will be highlighted. Conceptual efforts demonstrating or exploring integrated assessment models and decision support systems will be covered as well. This session topics include (but are not limited to):

- Integrated assessment models
- Air pollution decision support systems
- Air pollution-health, -agriculture, and -ecological policies
- Decision making under uncertainty and uncertainty analysis
- Air pollution economics
- Design of pollution abatement strategies
- Coordinated air pollution/climate policies

Session 4: Regulatory Modeling and SIP Applications

Air quality models continue to be important tools for guiding decision makers in preparing State Implementation Plan (SIP) applications to set standards for compliance. We seek abstracts that describe how air quality models are used in specific applications, with particular emphasis on the types of sensitivity and diagnostic analyses employed and on the model evaluation studies that were conducted for various applications. This session topics include (but are not limited to):

- Model intercomparison
- Statistical analyses and evaluation metrics
- Measurement networks
- Impacts on air quality that result from controlling air pollutants

Session 5: Emissions Inventories, Models, and Processes

This session is dedicated to the application of innovative methodologies for preparing and processing emissions for air quality modeling applications. Techniques to improve estimates of

dust and biogenic emissions are of special interest for this session. This session topics include (but are not limited to):

- Updates to inventories and emissions processing
- Emissions from alternative fuel use (e.g., bio-fuels in the transportation sector)
- Emissions from aviation activities
- Projection of emissions to future-year scenarios
- Inverse modeling
- Natural emission sources

Session 6: Air Quality and Climate Change

Scientific evidence highlights the role of the atmosphere's chemical constituents in driving climate variability at various scales. Direct radiative forcing due to the presence of certain chemical species of atmospheric aerosols (e.g., sulfate) tends to mitigate warming resulting from greenhouse gases. Short-lived climate forcers, such as sulfate, black carbon, and ozone precursors (including NO_x, VOCs, CO), are key players in forming the air quality and climate feedback loops. We seek abstracts that address linkages between regional climate variability and air quality. Session 6 topics include (but are not limited to):

- Regional climate impacts on air quality
- Impacts of air pollution on climate change
- Intercontinental transport of pollutants
- The climate impacts of short-lived climate forcers
- The impacts of clouds, as carrying media of pollutants and moisture, on climate
- International applications

Session 7: Model Evaluation and Analysis

Evaluation of air quality modeling systems (including meteorological and emissions models) is a key to identify the integrity of such modeling systems for various applications at various spatial and temporal resolutions. Abstracts are invited to present results of model evaluation studies, with emphasis on new techniques for model evaluation. This session topics include (but are not limited to):

- Diagnostic tools
- Analyses and comparisons with data from measurement networks
- Intermodel comparisons
- Process evaluation
- Evaluation of meteorological models

Session 8: Air Quality Measurements and Observational Studies

Papers in this session are devoted to analyzing data from both conventional and remote-sensing observational platforms. In particular, presentations are invited on the integration of data

collected from different platforms, and on the use of new satellite data products in air quality modeling. This session topics include (but are not limited to):

- Conventional measurement networks
- Field measurement studies
- Satellite data
- Data assimilation techniques

Session 9: Air Quality Forecasting

Real-time air quality forecasts are important source of information to alert the public of potential poor air quality conditions, and to support organizations that strive to improve public health. This session focuses on papers describing new improvements in air quality forecasting techniques, applications, and community needs. This session topics include (but are not limited to):

- Operational and computational needs
- Model performance evaluation and forecasting skills
- Objective analysis methods
- Accuracy and Spatial Resolution
- Public and media dissemination

Session 10: Posters covering all conference topics