JUNE 2010

CMAS Quarterly

The Quarterly Newsletter of the Community Modeling and Analysis System

Upcoming Events

(All are at UNC unless otherwise indicated)

9TH ANNUAL CMAS CONFERENCE:

- October 11-13, 2010

SMOKE Training:

- July 19-21, 2010
- October 6-8, 2010

CMAQ Training:

- July 22-23, 2010
- October 14-15, 2010

BenMAP Training:

- October 18-20, 2010

Remote Sensing Data Usage in Air Quality Assessments:

- October 25-27, 2010

Can't come to us for training? Have the same courses taught on-site at your location. Visit http://www.cmascenter.org/training/ classes.cfm or e-mail cmas@unc.edu.

❖

Credits

Content:

Adel Hanna
Tyler Fox
Bryan Hubbell

Editor:

Jeanne Eichinger

Please come visit us on the Web!

www.cmascenter.org

Air Quality Science: An Essential Ingredient for Successful Air Pollution Health Studies

Preparations are underway for the 9th Annual CMAS Conference (October 11-13, 2010). The deadline for abstract submission is June 18. This year, CMAS is organizing a special session designed to promote dialogue between atmospheric scientists and health scientists. The session will bring together these two groups to promote information exchange on updates and advancements, applications, gaps, and identification of needs and resources. The organization of this session was discussed during the last CMAS External Advisory Committee (EAC) meeting on October 2009, where members of the committee expressed great interest in devoting a session to this topic. Afterward, CMAS and EPA scientists started preparing for this 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 were primarily focused on examining correlations between air pollution measured at central site monitors and health outcomes. However, in recent years, epidemiologists have begun to focus on the differences in exposures and health risks associated with intra-urban gradients in air pollutant concentrations, and differential exposures to mixtures of air pollution that arise due to transport from and mixing of air pollution from a variety of sources, such as industry, traffic, and regionally transported pollution. Resulting requirements for highly resolved characterizations of pollutant mixtures have resulted in the increasing use of air quality models in health studies. Health scientists are actively pursuing the use of model predictions to augment or replace ambient measurements in conducting exposure/risk assessments and epidemiological studies. Regulatory assessments are increasingly being expec-

CMAS Visiting Scientists for Summer 2010

CMAS is pleased to host two visiting scientists at its UNC campus this summer: Dr. Amy Stuart of the University of South Florida, and Dr. Talat Odman of Georgia Institute of Technology.

Dr. Amy L. Stuart, Assistant Professor, University of South Florida, has an NSF career grant to study fine-scale exposures and equity impacts under different urban form conditions. The approach is to combine modeling (using CMAS and CALPUFF) and passive measurement campaigns for a few target pollutants. She is working on getting SMOKE/CMAQ configured for the Tampa area, particularly regarding emissions allocation. While at CMAS, Dr. Stuart will attend the CMAS SMOKE/CMAQ training scheduled for July.

Dr. M. Talat Odman, Principal Research Engineer, Georgia Institute of Technology, is a member of the CMAS External Advisory Committee (EAC) and is well known in the CMAS community. He participated in the early development of CMAQ, working on numerical algorithms for advection and diffusion processes. Dr Odman will work with CMAS scientists on exploring new ideas for urban-scale modeling and potential use of the adaptive grid scheme for studies related to urban-scale and health exposure applications.

Air Quality Science in Air Pollution Health Studies (cont'd.)

ted to identify susceptible populations that are vulnerable to pollutant exposures, and to inform 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, these uses create challenges for our modeling capabilities that are important for the modeling community to understand and address with future research and development activities. There are also important facets of modeling that need to be understood within the health research community, including the important differences between statistical models based on observational air pollution data (e.g., land use regression) and dispersion or chemical transport models such as AERMOD and CMAQ.

This special session is intended to promote dialogue between atmospheric and health scientists to improve understanding of the needs for various health studies and of what models are available or in need of development to meet these needs. Specific questions and points of discussion include:

- What are the critical exposure-related questions that health studies are trying to answer?
- What estimates of emissions, meteorology, and air quality concentrations are provided through atmospheric modeling? What are the different types of atmospheric models and their characteristics?
- What estimates of air quality concentrations are provided through atmospheric monitoring, and how can that information inform model evaluation?
- What are the statistical approaches and data analysis techniques that have been used to develop inputs to exposure modeling for health studies?
- Applications of air quality modeling for health and exposure studies
- Applications of statistical analysis of observational air quality data for health and exposure studies
- Evaluating applications of air quality modeling and statistical approaches in estimating air quality exposures for health studies
- Choosing between air quality modeling and statistical models of air quality: pros and cons

Invited speakers will provide background information along with examples of various health studies and of their uses of modeling and related techniques. Papers presented and panel discussions will focus on such studies, particularly those that have identified issues and compared approaches that can inform the community regarding best practices and potential future developments needed in this important area of environmental research.

New Model Releases Available from www.cmascenter.org: MCIP 3.6 and VERDI 1.3

The CMAS Center has released a new version of the Meteorology-Chemistry Interface Processor (MCIP 3.6). It provides various additional capabilities—for example, those related to map projections (including adding a reference latitude for WRF domains with Lambert conformal projection and "equatorial" Mercator representation); more gridding capabilities; compatibility with I/O API; land use classification schemes for WRF; and wind calculations.

CMAS is also about to release a new version of the Visualization Environment for Rich Data Interpretation (VERDI). VERDI 1.3 will include many new features, such as these:

- Observational data can be overlaid on fast tile plots, with support for multiple observational data set overlays.
- The maps on fast tile plots are configurable (regarding color, transparency, etc.).
- More projections are supported (Mercator, polar stereographic, latitude-longitude, UTM, etc.).
- CAMx data can be read.
- Maps can be shown in edit domain dialog.
- The minimum and maximum for the legend on the fast tile plot can be adjusted.
- The domain range can be specified for fast tile and regular tile plots.

Also, a few minor bug fixes have been performed in MCIP and VERDI. These resulted from various interactions with the user community via Bugzilla, the M3List listserv, and direct contact. These types of interactions, as well as other forms of communication with the CMAS Center, are much appreciated, as they are very useful in helping us to continually refine the models so that we can provide the best tools possible to air quality modelers.