SEPTEMBER 2008

CMAS Quarterly

The Quarterly Newsletter of the Community Modeling and Analysis System

Upcoming Events

(All are at UNC unless otherwise indicated)

7th Annual Conference:

- October 6-8, 2008

Early Bird Registration ends September 12!

SMOKE Training:

- October 1-3, 2008
- January 26-28, 2009

BenMAP Training:

- October 1-3, 2008
- January 26-28, 2009

CMAQ Training:

- October 9-10, 2008
- January 29-30, 2009

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.

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Credits

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www.cmascenter.org

CMAS: 7 Years of Success

With the CMAS Center turning seven in 2008, this is a good opportunity to look back on its objectives and achievements. CMAS was initiated in 2001 as a cooperative agreement with the U.S. EPA to establish a center to transfer knowledge on state-of-the-science air quality modeling to the modeling community. While fulfilling this objective has provided the community with much-needed modeling tools and information, the Center was also designed to leverage the community's intellectual capital to continue refining the air quality modeling systems and associated tools, and to support their application for critical problem analysis and decision-making. The user community for CMAS has grown to include scientists and policy makers from many academic, consulting, industry, and Federal and state government institutions from more than 90 countries. Multiple modeling tools, such as CMAQ, SMOKE, MM5, WRF, MCIP, AMET, BenMAP, Spatial Allocator, PAVE, and VERDI, have been made available to users.

CMAS is proud to have had a major role in creating a user community that has the knowledge to apply and analyze modeling results for various applications. Facilitated by CMAS, community members have engaged in wide-ranging discussions, both among themselves and with CMAS and EPA scientists, and have been very willing to help each other address various questions and identify problems and solutions. The CMAS e-mail-based query system has also kept valuable information flowing by providing an archive of queries and responses that all users can access on-line (e.g., concerning model operating questions and the identification of program bugs). The high level of community involvement has guided development needs that have then resulted in the creation of new versions of modeling systems and analysis tools. As these developments have occurred, CMAS has worked hard to ensure the integrity of the underlying science, through peer reviews and publications. Following major releases of the CMAQ model, CMAS has collaborated with EPA to organize model peer reviews that have convened groups of experts on air quality and meteorology to critically analyze the model's concepts and formulations. CMAS has also sponsored journal special issues of *Atmospheric Environment* (published 2006) and *Journal of Applied Meteorology* (upcoming issue 2008).

CMAQ Developers to Meet during CMAS Conference

To gain additional benefit from the presence of many key CMAQ scientists attending the annual CMAS conference in Chapel Hill, CMAS is again planning to hold an ad hoc meeting of community developers of CMAQ. Zac Adelman, CMAS Application and Training Coordinator, will lead the meeting's discussions, which will focus on issues related to current and future model releases and outstanding CMAQ technical issues. If you are interested in joining this meeting, please contact Zac (zac@unc.edu).

Two fundamental CMAS outreach activities have been its training program and its annual conferences. Besides quarterly CMAQ and SMOKE training sessions that are given at UNC, our training team has conducted training at many user-requested locations in the United States and abroad (Canada, Mexico, and Europe, to date). The training program has

CMAS: 7 Years of Success (cont'd.)

recently expanded beyond the CMAQ, MCIP, and SMOKE models to include the Environmental Benefits Mapping and Analysis Program (BenMAP). BenMAP is a Windows-based computer program that can be used for estimating the health impacts and associated economic impacts due to changes in ambient air pollution.

The annual CMAS conferences draw participants from all over the world. Each year we receive over 100 papers for oral and poster presentations at the conference. In addition to a core set of session topics that are kept constant from year to year (on various air quality modeling concepts), we also introduce new session topics that correspond to recent advances in air quality modeling and its application. This year, for example, we have special sessions on field measurement campaigns relevant to air quality and on the utilization of satellite measurements for data assimilation and model evaluation

When discussing CMAS and its years of accomplishments, thanks and appreciation are always due to the members of the CMAS External Advisory Committee (EAC), who take time from their busy schedules to provide CMAS with excellent guidance.

CMAQ Output Data for Community Use

CMAS is discussing with EPA a pilot effort to make available to the modeling community various detailed model outputs from selected CMAQ model runs that have been evaluated and analyzed. EPA/OAQPS would provide access to some of the CMAQ runs that are associated with completed rulemakings or other projects otherwise open for public view. The data would be based on one-year runs over the eastern and western United States at variable horizontal resolutions (36 km and 12 km). In addition, EPA/NERL is offering to provide access to the outputs from selected CMAQ runs that are related to fully published science products. CMAS will make recommendations to EPA regarding the organization and format of the metadata that will be needed by users who wish to access these runs.

Variable Grid Approach for CMAQ

In collaboration with EPA, CMAS scientists are developing a variable-grid modeling approach for CMAQ. The current procedure of performing nested-grid simulations is sequential and resource-intensive. Emissions and meteorological data fields must be prepared for each nested model domain at each resolution. CMAQ is then run first for the coarsest domain, and boundary conditions are extracted from that coarse domain to be fed to the next finer nest, then the simulation is run for that nest, and so on, until the innermost domain (finest nest) is run. In contrast, other similar modeling systems (e.g., CAMx, MASIP) can create a single modeling domain with variable resolutions within that one domain, where higher-resolution grids over urban areas (for example) can co-exist with coarser resolutions over regional, nonurban areas. Results for all resolutions represented across the domain are obtained with a single model execution, rather than with multiple sequential executions. Advantages of the variable-grid approach include more efficient model applications as well as informing the coarser-grid areas downwind of finer-grid areas with higher-resolution results. The variable-grid technique can assess the effects of finer-resolution emissions and chemistry on portions of the domain. While interpolation of the meteorological fields may not resolve local-scale meteorological features for the fine grids, they do create consistent meteorological fields across all grids and model resolutions of the variably gridded domain.

Dr. Christian Seigneur Leaves the EAC

Dr. Christian Seigneur of Atmospheric and Environmental Research (AER), who has been a long-time member of the CMAS External Advisory Committee (EAC), has resigned from the committee after accepting a new appointment in Europe. In discussions with CMAS Director Adel Hanna, Dr. Seigneur expressed his appreciation for the opportunity to serve the community as a member of the EAC. Christian's name will always be linked to advances in particulate matter research and modeling. For example, he is at the top of the list of developers of CMAQ-MADRID, a modeling version of CMAQ. Christian has provided an example of the talented scientist and community leader who is always willing to share his knowledge and expertise with others. We have greatly appreciated his support and guidance, and wish him the best in his new endeavor.

See You at the CMAS Conference October 6-8!