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# CMAS Quarterly

The Quarterly Newsletter of the Community Modeling and Analysis System

## Upcoming Events

(All are at UNC unless otherwise indicated)

### 11<sup>TH</sup> ANNUAL CMAS CONFERENCE:

- Oct. 15–17, 2012

### SMOKE Training:

- Oct. 10–12, 2012

### CMAQ Training:

- Oct. 18–19, 2012

### Remote Sensing Data Usage Training:

- Oct. 18–19, 2012



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](mailto:cmas@unc.edu).



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[www.cmascenter.org](http://www.cmascenter.org)

## CMAS Training Program Expands

In addition to our regular training courses on CMAQ, SMOKE, and BenMAP (see sidebar), this fall the CMAS Center will resume its training course titled "Remote Sensing Data Usage in Air Quality Assessments." The course will be taught by NASA-sponsored instructors, with support from CMAS staff, on October 18-19, 2012. It will provide an overview of remote sensing capabilities for air quality applications through tutorials and hands-on exercises.

Training will cover the use in air quality studies of aerosol, trace gas, and fire-related data products from satellite and ground-based instruments. The course will also explain how to access and interpret satellite imagery to analyze air quality during exceptional events such as forest fires and dust storms. Hands-on modules will guide participants in examining post-processed CMAQ model output from selected air pollution episodes to perform one-on-one comparisons against remotely sensed data from NASA's Ozone Monitoring Instrument (OMI) and Moderate Resolution Imaging Spectroradiometer (MODIS). (Note that operational knowledge of CMAQ is helpful but is not required.) Other topics will include satellite-based fire products, and web access to these data. The course is

offered through NASA support (instructor participation) at a reduced registration fee of \$400 for nonstudent participants, or \$300 for student participants with proof of eligibility. Registration can be done through the CMAS website ([www.cmascenter.org](http://www.cmascenter.org)). Participants will be expected to use their own laptops.

The CMAS Center also plans to offer two new training courses in the near future. The first course is on meteorological modeling for air quality applications. It will introduce researchers to the concepts of meteorological modeling, with emphasis on the preparation of data inputs and the postprocessing of outputs for use in air quality models such as CMAQ. Meteorological modeling discussions will use the Weather Research and Forecasting (WRF) model to demonstrate input preparation, data assimilation, and the concepts of cloud and boundary-layer processes. The hands-on training will also introduce participants to various graphic and visualization tools used for the analysis and evaluation of meteorological models.

The second course that will be offered is on the interpretive analysis involved in using air quality models. It will focus on in-depth analysis of inputs to and outputs from air quality models such as CMAQ and

CAMx. It is an advanced course designed for those who have completed the Center's CMAQ and SMOKE trainings. It would also be very useful for air quality managers and environmental decision makers, offering them methodologies and tools they could use for accessing and analyzing model inputs/outputs using EPA's Atmospheric Model Evaluation Tool (AMET); AMET will be used to compare meteorological and air quality measurements to modeling simulations. Among the air quality measurements that will be used during the analysis process are data from the Chemical Speciation Network (CSN, formerly STN); the Clean Air Status and Trends Network (CASTNet); the National Atmospheric Deposition Program (NADP); the Air Quality System (AQS); the Southeastern Aerosol Research and Characterization Study (SEARCH); the National Emissions Inventory (NEI); and the Interagency Monitoring of Protected Visual Environments (IMPROVE).

For further information on the existing classes, please go to [www.cmascenter.org/training.cfm](http://www.cmascenter.org/training.cfm). For information on the new courses being developed, contact Zac Adelman, CMAS Support and Training Coordinator, at [zac@unc.edu](mailto:zac@unc.edu).

## CMAS Conference(s): Bringing the Community Together

On October 15-17, 2012, the CMAS Center will be holding the 11<sup>th</sup> Annual CMAS Conference at the Friday Center of the University of North Carolina at Chapel Hill. This year's conference will include eight sessions. One of the key sessions is on global/regional modeling, in which participants will hear presentations on issues related to the consistent coupling of atmospheric physical and chemical processes on local to global scales and related modeling applications, including intercontinental transport and potential impacts on regional background pollutant levels. Another session will focus on coupled meteorology/chemistry models, which are important tools for analyzing the potential impacts of air quality on regional climate. On the regulatory side, the session on secondary impacts from single sources or single-source complexes will discuss advances in modeling the potential impacts from proposed new emission sources and the assessment of prescribed

or naturally occurring fires on air quality and air-quality-related parameters (visibility and surface deposition).

We are delighted to have as this year's keynote speaker Dr. Len Peters, Secretary of the Energy and Environment Cabinet for the Commonwealth of Kentucky. As an atmospheric scientist and air quality modeler, Dr. Peters will certainly feel at home at CMAS, and we are looking forward to his talk.

CMAS is also involved in organizing other international conferences. You may recall that in January 2011 CMAS organized the "Air Quality Modeling in Asia 2011" conference in collaboration with the Korean Society for Atmospheric Environment (KOSAE) at Konkuk University in Seoul, Korea; this conference was sponsored by the Korean Ministry of the Environment, Konkuk University, and POSCO (Pohang Iron & Steel Co.). Recently a special issue of the journal *Atmospheric Environment* was published that con-

### Special Journal Issue on 2012 CMAS Conference

The CMAS Center has arranged for the publication of a special issue of the *Journal of the Air & Waste Management Association*. It will include selected papers presented at the upcoming CMAS conference. For the 2012 CMAS conference, CMAS has received 150 abstracts for presentations during the eight sessions. Authors should contact Dr. Adel Hanna ([ahanna@email.unc.edu](mailto:ahanna@email.unc.edu)) by October 31, 2012, if they would like to submit a paper to the special issue so that we can estimate the number of articles for journal submission. The deadline for submitting papers to A&WMA is expected to be December 15, 2012; this will give authors ample time to revise their papers following the conference presentations and discussion/feedback from peers. Authors will pay publication costs (see the "Journal Page Charge Policy" file available at [http://www.awma.org/Public/ScholarOne\\_Styleguide.aspx](http://www.awma.org/Public/ScholarOne_Styleguide.aspx)).

Facilitating peer-reviewed publication of various kinds is one of the goals of the CMAS conferences, to reach out to members of the community at large and to ensure scientific competence of conference papers. Over the past 11 years since its inception, CMAS has sponsored five peer-reviewed special issues. The most recent was the *Atmospheric Environment* issue mentioned in the article surrounding this sidebar.

tained papers presented during the conference. This year, CMAS is working with the Institute of Astronomy, Geophysics and Atmospheric Sciences (IAG) at

the University of São Paulo, Brazil, to organize the 1<sup>st</sup> CMAS South American Conference, which is tentatively planned for February 2013.

## AERLINE, a New Research Dispersion Modeling System

The Air Exposure Research model for Line sources (AERLINE) is a dispersion modeling tool being developed by EPA ORD primarily for near-roadway assessments. AERLINE is part of the ongoing comprehensive

evaluation of air quality impacts in the near-road environment. The model is based upon a steady-state Gaussian formulation and is designed to simulate line-type source emissions (e.g., mobile sources along roadways) by numerically

integrating point-source emissions. AERLINE is currently formulated for near-surface releases; contains new formulations (based on field and wind tunnel studies) for the vertical and lateral dispersion rates; simulates low

wind meander conditions; includes Monin-Obukhov similarity profiling of winds near the surface; and selects plume-weighted winds for transport and dispersion calculations. The model utilizes the surface meteorology provided  
(continued on next page)

## Are You Using All Available CMAS Support Tools?

The CMAS Center provides a set of web sites and links to support the air quality community's needs, requests, and enquiries (see table below). We perform web-site-based Internet support of CMAQ, SMOKE, MCIP, VERDI, Spatial Allocator, AMET, and BenMAP. In addition, e-mail listservs organized by software product are made available to support users' requests and to facilitate discussions among community members. The modeling and analysis tool sites (for example, for CMAQ and SMOKE) are used more frequently than others, especially following a new release of a model or tool. From June 1, 2011, through May 31, 2012, CMAS received 10,320 unique product download requests, for 12 different software packages. This

represents about a 6.5% increase in product downloads compared with the previous year (June 2010 through May 2011). CMAQ and SMOKE are the most-requested downloads, followed by VERDI and MCIP. During the 2011–2012 period, CMAS received 309 technical support requests.

In contrast to this large demand for model and tool downloads and support, the M3dev listserv, which was launched to facilitate communication within the model development community, is quite underutilized (it received no postings during the 2011–2012 period). We renew our invitation to model developers to use M3dev to share your ideas and discuss potential improvements to and development of various modules and tools.

## AERLINE Modeling System (cont'd.)

by the AERMET model and includes user-friendly input requirements, such as simplified road-link specifications. Model simulation with integrated point sources has been formulated for both computational efficiency and careful attention to appropriately simulating line-source emissions for receptors very near the source line. The current beta version of the model is designed for flat roadways (no surrounding complexities). The model framework will be able to accommodate future algorithms for simulating the near-source effects of complex roadway configurations (e.g., noise barriers, depressed roadways).

While there are existing algorithms designed for estimating concentrations in the vicinity of roadways (for example, CALINE), these approaches are currently not supported, nor do

they give sufficient attention to near-road complexities and very-near-road concentrations (within a few meters of the road). EPA initiated a research effort to design and conduct wind tunnel and field studies to evaluate pollutant transport and dispersion, and this work resulted in new and expanded databases for development and evaluation of improved line-source algorithms.

AERLINE 1.0 Beta is the initial modeling product of this development program. It is a research tool that is being developed primarily to support risk assessments and health studies related to near-road pollutants. Detailed information on AERLINE will be presented at the CMAS conference in October. Watch for a CMAS release of AERLINE 1.0 Beta in the weeks following the conference.

URL	CMAS Support Tool Description/Purpose
<a href="http://www.cmascenter.org">http://www.cmascenter.org</a>	Central web portal to the CMAS Center
<a href="http://www.cmaq-model.org">http://www.cmaq-model.org</a>	Air quality modeling
<a href="http://www.smoke-model.org">http://www.smoke-model.org</a>	Emissions processing
<a href="http://www.benmap-model.org">http://www.benmap-model.org</a>	Economic and health impact modeling
<a href="http://www.verdi-tool.org">http://www.verdi-tool.org</a>	Visualization and graphics
<a href="http://bugz.unc.edu">http://bugz.unc.edu</a>	E-mail-based technical support
<a href="http://www.cmascenter.org/irods">http://www.cmascenter.org/irods</a>	Model output data distribution
<a href="http://cmas.wikidot.com">http://cmas.wikidot.com</a>	Model development wiki
<a href="mailto:m3user@listserv.unc.edu">m3user@listserv.unc.edu</a>	E-mail forum for technical support
<a href="mailto:m3list@listserv.unc.edu">m3list@listserv.unc.edu</a>	E-mail forum for announcements
<a href="mailto:m3dev@listserv.unc.edu">m3dev@listserv.unc.edu</a>	E-mail forum for software development discussion
<a href="mailto:emregional@listserv.unc.edu">emregional@listserv.unc.edu</a>	E-mail forum for emissions-related announcements and discussion
<a href="mailto:benmap-user@listserv.unc.edu">benmap-user@listserv.unc.edu</a>	E-mail forum for BenMAP-related announcements and discussion