First CMAS South America Conference Held in São Paulo, Brazil

Each fall for the last 11 years, CMAS has conducted its annual conference and training program in Chapel Hill that draws hundreds of scientists and policy makers to learn about best practices in air quality and emissions modeling. Participants travel from around the world to take part in this premier event.

Last February, scientists and policy makers in South America had the opportunity to gain the modeling knowledge and skills right in their own region, when CMAS was invited by the Department of Atmospheric Sciences at Brazil's University of São Paulo (USP) to host the 1st CMAS South America conference and training on emissions modeling and air quality. Dr. Maria de Fatima Andrade, head of the Department of Atmospheric Sciences at USP, co-led the program with the CMAS Director, Dr. Adel Hanna. Leading Brazilian hosts were Dr. Taciana Albuquerque and Dr. Rita Yuri Ynoue of USP. The CMAS U.S. team members who traveled to Brazil included CMAS Application and Training Coordinator, Zac Adelman; CMAS Software Development Coordinator, Sarav Arunachalam; CMAS Research Coordinator, Uma Shankar; and Mr. Shawn Roselle from the U.S. EPA.

Like the annual programs in Chapel Hill, the South American event started with an extensive training program on the SMOKE and CMAQ modeling systems, followed by a three-day conference. Fifty-five participants concerned with air pollution and atmospheric chemistry participated in the conference, including scientists from several Latin American countries and technicians from Brazil's state environmental agencies. The U.S. CMAS team presented on a variety of topics at the conference, including details of their studies on air quality modeling and environmental and health impacts of air pollution. Modeling experts from USP and other regional institutions also presented to the attending policy makers and scientists.

In addition, the CMAS South America program provided an opportunity to identify ways in which the CMAS Center can help these important regional partners. A second annual conference in South America is being planned.

A group of attendees enjoying Day 3 of the São Paulo conference

RLINE Joins the CMAS Family of Modeling Tools

Later this year, the CMAS Center expects to release the Research LINE source model (RLINE). A beta version is currently available from EPA for testing.

What is RLINE?

RLINE is a research-grade dispersion model currently under development by EPA's Office of Research and Development (ORD) for near-roadway assessments. This model, part of ORD's ongoing evaluation of air quality impacts in the near-road environment, has been developed primarily to support risk assessments and health studies related to near-road pollutants. The research 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. The current version, RLINE 1.0 Beta, is formulated for near-surface releases; contains new (field-study- and wind-tunnel-based) formulations 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 by the AERMET meteorological data preprocessor, and includes user-friendly input requirements, such as simplified road-link specifications. Model simulation with integrated point sources has been formulated with 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), with future research efforts expected to accommodate new algorithms for simulating the near-source effects of complex roadway configurations (depressed roadways, noise and vegetative barriers, etc.).

How do I access RLINE?

There will be five major components of the RLINE beta model release: model code (including executable and source code); test case data and instructions (including input and output from a demonstration run); evaluation data and details on model setup; documentation (including user guide and publications); and qualification of appropriate use. To access these materials, please email David Heist (heist.david @epa.gov) and Michelle Snyder (snyder.michelle @epa.gov). *Please note that the beta version of RLINE is being released for testing purposes only.*

Why was RLINE developed?

Growing concern about human exposure and related adverse health effects near roadways initiated an effort by the U. S. EPA to re-examine the dispersion of mobile-source-related pollutants. These adverse effects, in combination with the fact that a significant portion of the population spends time within a few hundred meters of major roadways (at home, work, or school), support a need for dispersion modeling to capture the temporal and spatial variability of mobile-source pollutants in the near-road environment. A research effort was initiated to design and conduct wind tunnel and field studies to evaluate pollutant transport and dispersion of near-surface releases; these provided new and expanded databases for development and evaluation of improved line-source algorithms. RLINE 1.0 Beta is the initial modeling product of this program.

What RLINE is not

The RLINE model is not appropriate for regulatory applications (e.g., NAAQS compliance and enforcement, NSR/PSD permitting, PM Hot-spot Conformity Analyses, SIP analysis) because it has not undergone the extensive testing and comprehensive evaluation that are needed for such regulatory uses. For guidance on dispersion models that are appropriate for regulatory use, see EPA's *Guideline on Air Quality Models* published as Appendix W to 40 CFR Part 51 (November 2, 2005) and EPA's "Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas" (December 2010; EPA-420-B-10-040).

CMAS Recent and Upcoming Releases

The month of May concluded a very active year of model and tool releases issued by the CMAS Center. Among these were the releases of CMAQ 5.0.1, SMOKE 3.1, WRF-CMAQ 5.0.1, CoST 2.5, MCIP 4.1, VERDI 1.4.1, AMET 1.2, and Spatial Allocator (SA) 4.0. EPA and the CMAS Center are currently working on a number of advances that will be included in releases scheduled for later this year. For example, CMAQ 5.0.2 will include capabilities for sulfur tracking, the decoupled direct method (DDM), source apportionment, advanced plume treatment, and volatile basis set; we thank the user community members who have helped or are helping EPA and CMAS develop some of these new modules. VERDI 1.4.2 will be a new release with advanced features related to vector plots and a generalized file reader. SA 4.1 will include upgrades to facilitate the utilization of MODIS remote-sensing products for modeling applications.

CMAS User Support and Download Requests

Through the CMAS web site (www.cmascenter.org) we provide technical and operational support for CMAQ, SMOKE, MCIP, Spatial Allocator, AMET, VERDI, BenMAP, and the Input/Output Application Programming Interface (I/O API) as well as CoST. The CMAS web site directs users seeking support to an online help desk, which is a portal for web-based e-mail support, listservs, frequently asked questions (FAQ) lists, model documentation, and hardware recommendations.

From June 1, 2012, to May 31, 2013 (the fourth CMAS contract year), the CMAS Center received 9,795 unique product download requests for 11 different software packages (see chart below). This represents about the same number of product downloads as in the previous contract year (June 2011 through May 2012). CMAQ and SMOKE accounted for 64.0% of all 2012-2013 download requests. While PAVE is still being downloaded, VERDI had over three times as many downloads as PAVE during this period. We received 407 download requests for the Spatial Allocator, and 212 download requests for AMET.

CMAS Center Added as ESIP Federation Partner

The Federation of Earth Science Information Partners (ESIP) (http://esipfed.org/) announced the admission of the CMAS Center (along with eight other organizations) as a partner organization during its summer meeting, held July 8–12 at UNC's Friday Center. ESIP Federation partners (now numbering 160) work globally to connect various domain, sector, and agency communities to exchange knowledge about emerging Earth science data, technical, and science topics. The overall goal is to improve discovery, access, and use of broadly distributed Earth science data. With this new cohort of nine additional partners, the ESIP Federation is broadening its reach in the community of providers and users of Earth science data and information technology.

The CMAS Center has been added as a Type II ESIP partner, which designates that it is primarily a research center. Other new partners added this year are Discinnet Labs, Geological Survey of Alabama, Jet Propulsion Laboratory Data Systems and Technology Group, Knowledge Motifs, NASA Capacity Building Program, National Center for Ecological Analysis and Synthesis, OPenDAP, and Vightel Corporation. A summary of each organization's activities can be found at http://bit.ly/18RqIRn.

Through this partnership, CMAS and its user community can become more fully engaged in sharing knowledge, technology, and data with other members of ESIP—for example, by participating in ESIP clusters such as Decisions and Air Quality, exploring collaborative projects, and extending the scope of its training programs through other ESIP partners.

CMAS Product Downloads (June 2012 - May 2013)

(Horizontal bar chart showing Number of download Requests by product: BenMAP, CoST, NETCDF, AMET, PAVE, Spatial_Allocator, IO_API, MCIP, VERDI, SMOKE, CMAQ — x-axis from 0 to 5000)

Mark your calendars!
12th Annual
CMAS Conference
October 28–30, 2013