CERC ADMS-Urban & ADMS-Roads News Summer 2018

Contents

Latest model release: version 4.1.1, Jan 2018

News

ADMS-Urban & ADMS-Roads User Group Meeting

The 2018 ADMS-Urban and ADMS-Roads User Group Meeting will be held in Edinburgh on 8th November. Come along for an engaging day of talks from CERC staff and software users and hear the latest news and advice about modelling using ADMS-Urban and ADMS-Roads. This year speakers include Alan McDonald from SEPA, Mark Chapman from Cundall and Blaise Kelly from Hydrock.

Users with current support are entitled to one or more delegate places free of charge, depending on the type of licence held.

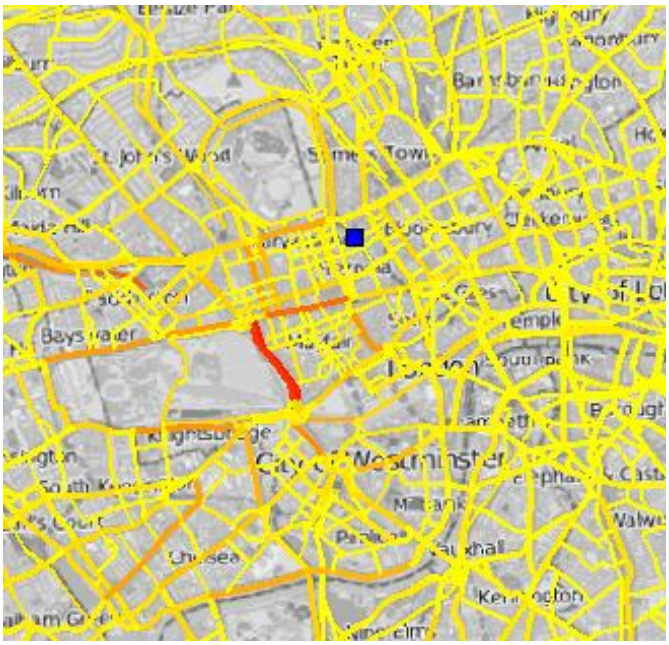
Please book your place via our website. Registration will remain open until 29th October 2018.

Upcoming release of ADMS-Urban, ADMS-Roads and ADMS-Airport 5: new features

The next release of ADMS-Urban, ADMS-Roads and ADMS-Airport, version 5, is coming early next year. With this new version you will be able to:

- Output the per source concentration at an output point, along with a new facility in the ADMS Mapper to allow this data to be visualised.
- Specify separate profiles for each pollutant in time-varying emission factor files
- Specify traffic counts for road sources that have user-defined emissions for more accurate traffic-induced turbulence
- Specify across-road distances for intelligent grid points, including taking into account the widths of advanced canyons
- Improved road source geometry to reduce gaps and overlaps at corners
- Easily import data from ADMS 5 by opening APL files
- Increase the scope of your modelling by including more outputs, more emissions and more pollutants in each run

Please ensure that you receive the latest versions of ADMS models as soon as they are released by keeping your support contract up-to-date.



The figure shows the contribution to concentration from each road source at the output point (blue square).

ADMS-Urban, ADMS-Roads & ADMS-Airport 4.1.1 with Emissions Factors Toolkit 8

The latest release of ADMS-Urban, ADMS-Roads and ADMS-Airport contains emission factors from Defra's latest Emissions Factors Toolkit (EFT 8) in addition to a range of usability upgrades, such as the ability to open multiple copies of the interface simultaneously.

The updated release is available from the User Area for users with current support.

EMIT patch with Emissions Factors Toolkit 8

EMIT is our software tool for compiling and editing emissions inventories, including quantifying contributions from individual vehicle types, such as older diesel cars, to emissions (and concentrations, when used with ADMS-Urban or ADMS-Roads). An EMIT patch is now available with emission factors from Defra's latest Emissions Factors Toolkit (EFT 8). Further details and the patch itself can be downloaded from our User Area.

'Hyper-local' air mapping in London with smart sensors and Google Street View cars

Sadiq Khan, the Mayor of London, and C40, a network of cities committed to bold action on climate change, have launched a cutting-edge new project to better understand Londoners' exposure to air pollution around the city. Sensors measuring harmful pollution in tens of thousands of locations will be combined with air quality modelling to produce hyper-local air quality mapping.

This summer, new fixed and mobile sensors will be rolled out across London's streets. 100 fixed sensors will be fitted to lampposts and buildings in the worst affected areas and sensitive locations, and two dedicated Google Street View cars will be driving across the city, mapping air pollution at an unprecedented level of detail. CERC's renowned ADMS-Urban model will be used together with the sensor data to generate hyper-local air quality mapping for nowcasts and forecasts, and for policy studies.

The project will be run by a team of air quality experts led by the charity Environmental Defense Fund Europe, in partnership with CERC, Air Monitors, Google Earth Outreach, University of Cambridge, National Physical Laboratory, and the Environmental Defense Fund team in the United States.

ADMS-Urban RML is being used to model Delhi air quality

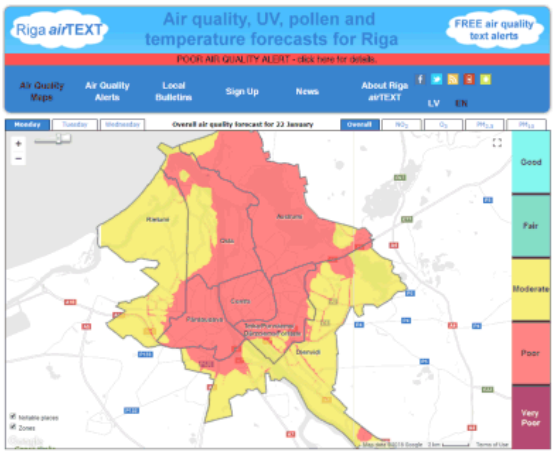
CERC are partners in the 'Process analysis, observations and modelling - Integrated solutions for cleaner air for Delhi' (PROMOTE) project, collaborating with six UK universities and five Indian research institutes. This project will investigate the interactions between meteorological processes such as winter fog events and poor air quality, as well as the relative importance of local and regional pollutant emissions and possible mitigation approaches. It is part of the wider Atmospheric Pollution and Human Health in an Indian Megacity programme, jointly funded by the Natural Environment Research Council (NERC), the Medical Research Council (MRC), the Newton-Bhabha Fund, the Ministry of Earth Sciences (MoES) and the Ministry of Science and Technology Department of Biotechnology.

ADMS-Urban will be used to model street-scale air quality in Delhi during the PROMOTE project. It will be coupled to the regional WRF-Chem and CMAQ models using the ADMS-Urban Regional Model Link (RML) system in order to investigate the interactions of regional and local effects. The project brochure gives more information about the full aims of the project and activities of other project partners.

*air*TEXT News

Residents of Riga now benefit from a new free service, Riga *air*TEXT, launched on 27th February at Riga City Hall. Riga *air*TEXT informs the public with free air quality alerts by text message and emails. Air quality forecasts up to three days ahead are available online at www.rigaairtext.lv and in a free phone app.

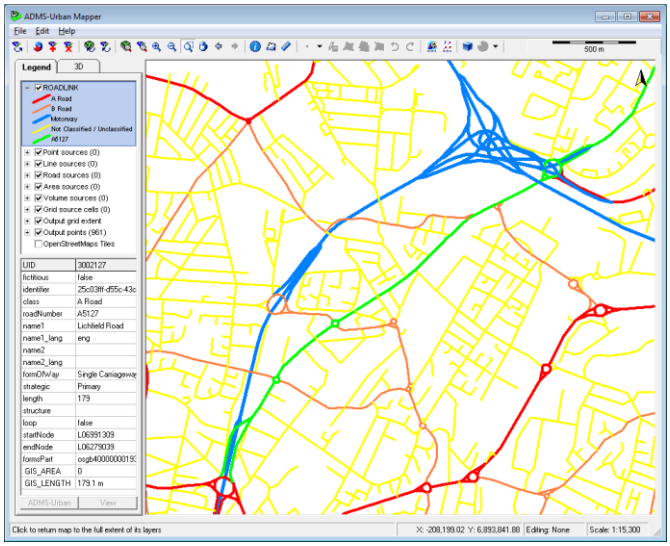
We are also delighted to welcome Thurrock Council to the *air*TEXT air quality and health forecasting service. Thurrock residents can now sign up for free air quality alerts by SMS text message, email, voicemail, and Twitter. The forecasts are also available on a free phone app for Android.



Modelling Tips and Issues

Making the most of the ADMS-Urban and ADMS-Roads Mapper: Helpdesk note

The ADMS Mapper can be used to visualise your model input together with project data you may have in other file formats such as shape or AutoCAD files. This can easily be overlaid on a background map, which is very useful for correcting the location of sources and receptors, checking input emissions and viewing output concentrations. A new helpdesk note has been written that describes how to make the most of the SQL style syntax of the renderer to query data in the Mapper. For example, it is possible to colour road sources by type or by name in order to easily locate particular roads, as illustrated to the right.



Helpdesk notes on carrying out many common model tasks are available to download from the User Area by those who have up-to-date support.

Import/Export tools to replace Access-format Emissions Inventories

The ADMS models all include 'Import' and 'Export' tools, accessible from the File menu. These powerful tools give you great flexibility: you can prepare sources, emissions, buildings, traffic, group membership and pollutant data in your preferred data editor (e.g. Excel) and then 'Import' these data into the model; you can export data, carry out changes and re-import the data for further modelling; you can also move data easily between ADMS models using these tools. EMIT can also export data in this format.

The model User Guides (select 'Help', 'User Guide') give full instructions on how to use the import/export tools (Section 5). These tools, which use simple readable CSV files to store data, are designed to replace the 'Emission Inventory' Access databases (MDB format). Emission Inventory databases will not be supported in future model releases, so all users are encouraged to convert any existing MDB format emission inventories to the new format. This is easy to do: simply import the emissions inventory data (select 'Emissions inventory', 'Import from emissions inventory') and then export the data using the 'Export' tool from the 'File' menu.

Spatially varying roughness

The complex terrain spatially varying roughness option can be used to represent the effect on dispersion of varying land use around a site. For example, an inland body of water would have a small roughness length but a neighbouring urban, industrial or forested area could have a large roughness length. Changes in roughness length should be limited to an order of magnitude in the file. The Complex terrain sections of the model User Guides (4.8 and 10.16 in ADMS-Roads, 4.9 and 10.17 in ADMS-Urban) have more details.

Deposition parameters for pollutants

When modelling dry or wet deposition, it is necessary to input additional parameters in the palette of pollutants. For dry deposition, these parameters depend on the nature of the pollutant. For gaseous pollutants, either the deposition velocity or the nature of the gas is required. For particulate pollutants, either the deposition and terminal velocities or the size and density of the particles must be input. For wet deposition, parameters relating to the washout coefficient are required. When modelling deposition, it is important to check these parameters for each pollutant being modelled, as the default values are unlikely to be appropriate. Suggested values for some common pollutants are given in the model User Guides (Section 4.5.4 for dry deposition and Section 4.6.4 for wet deposition).

Wet deposition and volume sources issue

An issue has been found which means that wet deposition flux may be incorrectly calculated for volume or grid sources. If you think your modelling is affected by this issue, please contact us for more details.

Recent Publications

ADMS-Urban and ADMS-Roads publications

Carruthers DJ, Stidworthy AL, Clarke D, Dicks KJ, Jones RL, Leslie I, Popoola OAM, Billingsley A and Seaton M, 2017: *Using Sensor Data and Inversion Techniques to systematically reduce Dispersion Model Error*. 18th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes, Bologna, Italy, October 2017. Article online

Hood CM, Stocker JR, Carruthers DJ, Grayson W, Handley J, Fung J and Yeung D, 2017: *Integrating regional and local modeling to create a high-resolution air quality forecasting system for Hong Kong*.16th Annual CMAS Conference, Chapel Hill, NC October 2017. Article online

Stidworthy A, Jackson M, Johnson K, Carruthers D and Stocker J, 2017: *Evaluation of Local and Regional Air Quality Forecasts for London*. 18th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes, Bologna, Italy, October 2017. Article online

Other model publications

Monteiro A, Durka P, Flandorfer C, Georgieva E, Guerreiro C, Kushta J, Malherbe L, Maiheu B, Miranda AI, Santos G, Stocker J, Trimpeneers E, Tognet F, Stortini M, Wesseling J, Janssen S and Thunis P, 2018: *Strengths and weaknesses of the FAIRMODE benchmarking methodology for the evaluation of air quality models*. Air Quality, Atmosphere and Health, pp. 1-11. Article online

Price C, Tickle G, Attree M, Lad C and Carruthers D, 2017: *High Level Review of the Sensitivity of Dispersion Model Predictions to Individual Source Term*. Atmospheric Dispersion Modelling Liaison Committee, ADMLC/2016/1 Report. Article online

Smith S, Stocker J, Seaton M and Carruthers D, 2017: *Model inter-comparison and validation of ADMS plume chemistry schemes*. International Journal of Environment and Pollution, vol.62, no.2/3/4, pp. 395-406. Article online

Stocker J, Ellis A, Smith S, Carruthers D, Venkatram A, Dale W and Attree M, 2017: *A review of dispersion modelling of agricultural emissions with non-point sources*. International Journal of Environment and Pollution, vol.62, no.2/3/4, pp. 247-263. Article online

Valencia A, Venkatram A, Heist D, Carruthers D and Arunachalam S, 2018: *Development and evaluation of the R-LINE model algorithms to account for chemical transformation in the near-road environment*. Transportation Research Part D: Transport and Environment, vol. 59, pp. 464-477. Article online

A comprehensive list of all our publications may be found on the publications section of our website.

Training Information

Discount on CERC training courses

A 20% discount applies to scheduled CERC training courses, if purchased at the same time as a software annual licence or support renewal. This discount also applies to one-day refresher courses. Training must be booked within 12 months of purchase.

Upcoming training courses

Our training courses focus on giving users the knowledge and expertise to efficiently apply CERC software to real-life air quality problems. CERC holds regular 2-day courses at its Cambridge offices. The table shows scheduled training dates for 2018.

Courses may also be arranged at alternative locations and/or dates and can be customised to particular user requirements; for further details, see www.cerc.co.uk/training or contact CERC.

Course	Oct
ADMS-Roads	23 - 24
ADMS-Urban	30 - 31

Products and Services

CERC has been developing world-leading air dispersion and complex flow modelling solutions since 1985. Our consultancy team was established to apply our expertise to a wide variety of applications for a diverse client base.

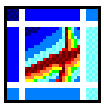
Other software solutions

ADMS 5

Local scale air quality modelling for industrial sources

GASTAR

Modelling emergency releases of dense gases



ADMS-Urban Regional Model Link

Automated nesting of ADMS-Urban within a regional air quality model

FLOWSTAR-Energy

Modelling wind energy and airflow at high spatial resolution for wind farm planning and other airflow-related applications

ADMS-Airport

Urban scale modelling with detailed treatment of aircraft emissions

ADMS-STAR

Short-term accidental release modelling

For custom-made software solutions, see www.cerc.co.uk/research or contact CERC.

Consultancy services

Our consultancy services include:

- Air quality assessments, e.g. odours, LAQM, planning and permitting
- Specialised modelling, e.g. dioxins, accidental releases, wind energy
- Compilation of emissions inventories and forecasting for large urban areas
- Project support and review services
- Research with complex atmospheric flows and air quality

For more details, see www.cerc.co.uk/consultancy or contact CERC.

Contacting the helpdesk

The CERC helpdesk is on hand to provide model support. Contact us:

- From the ADMS-Urban or ADMS-Roads interface, select Help, Email CERC
- Email help@cerc.co.uk
- Phone +44 (0)1223 357773