CERC   ADMS 5 & ADMS-Screen News   Summer 2020

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News

Communications with CERC during the COVID-19 pandemic

During this period of reduced social interaction and home working, all at CERC are making sure we continue to interact with and support our model users and clients.

We are handling all email helpdesk and enquiries as usual, but we have suspended telephone support for the time being, so please email us for everything. Please see our contact page for details.

Face-to-face training courses are currently suspended. We are in the final stages of setting up online training courses; these are currently on trial and will be available from September. Full details including online course dates and fees will be published on our website in September. Please email us if this interests you.

We will update our website if there are any changes to the above. Please get in touch by email if you have any questions.

ADMS 5 User Group meetings

The 2019 ADMS User Group Meetings took place in Oxford on 13-14 November. Talks encompassed a range of themes including modelling tips and case studies. Many thanks to Julia Burnell from Mott MacDonald, Kieran Laxen from Air Pollution Services and Rosie Davies from Arup for their talks.

Electronic copies of the presentations are available to download from the CERC website User Area.

The 2020 User Group Meetings will take place on 18th-19th November and will be held online due to the ongoing uncertainty around the COVID-19 situation. Registration will open soon.

Changes to the CERC website User Area

We have moved our User Area downloads to a new system that will make it much easier for you to find what you are looking for. You will still be able to use links on our website, but once logged in you can browse everything there is to download in a simple folder structure.

If you are currently registered for the User Area, with a login scrd password, you will have already received an email inviting you to sign up to the new User Area downloads. Just click the link, which will take you to the 'Welcome' screen containing your details where you can enter a new password to gain access to the latest software releases, technical guidance, modelling support documents and more. For any of our users who are not yet taking advantage of the User Area, you can sign up via the online form. The User Area is for all customers with current support for one of more of our products.

ADMS 6

The development team at CERC are hard at work developing the next release - ADMS 6. This new release will include plenty of new features, including many that were introduced in the latest releases of ADMS-Urban and ADMS-Roads, version 5, which were released in April. These new features will include improvements to the buildings and complex terrain modules, a host of improvements to the Mapper, such as the ability to clip output points to a site boundary and new concentration-per-source output to help with source apportionment, and many usability improvements.

Investigating emission limits for the Norwegian Environment Agency

The Norwegian Environment Agency has commissioned CERC to study how air concentration benchmarks for specific metals and polycyclic aromatic hydrocarbons (PAHs) correspond to annual emissions to air from a particular source.

In Norway, the major industrial sources of these emissions are non-ferrous metal industries such as aluminium and manganese production. Other contributors include graphite producers, inorganic chemical manufacturers and oil and gas refineries.

The key question in the study is how much can be emitted for a given set of emission parameters before the concentration benchmarks are reached? The answer will be determined through modelling using CERC's industrial dispersion model ADMS 5.

The Norwegian Environment Agency will use the results for screening, to decide whether detailed dispersion modelling is required for a specific facility.

Modelling Tips

Modelling calm conditions

ADMS 5 has an optional capability for treating very low wind speeds. By default, ADMS 5 does not model hours where the wind speed is less than 0.75 m/s, but activating the 'Calms' option, via the 'additional input file', allows lower wind speeds to be modelled. A key feature of low wind speeds is that the wind direction is highly variable. To reflect this, ADMS 5 splits the dispersion into two types of plume: the usual Gaussian plume aligned in the direction of the wind, and a radially-symmetric plume, with concentrations calculated as a weighted average of the two. The figure shows an example of the concentration pattern that results a) *without* and b) *with* the Calms module being employed.

a)   b)
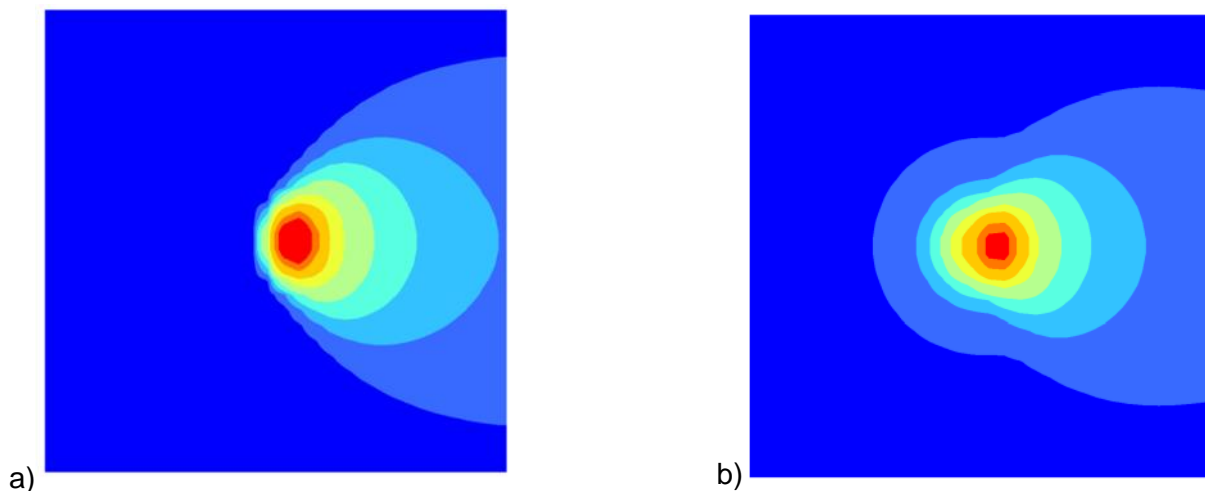
Comprehensive Output file

If you need to generate a large amount of detailed output from ADMS 5, such as hourly values at many receptors or over a grid, then using the Comprehensive Output option and processing tool could help. With just a single model run, a wide range of statistical information can be generated post-run.

The comprehensive output file can be generated by simply switching on the option in the Output screen, and the in-built tool for processing the file can be found under the Results menu option. Results for concentrations and deposition rates can be processed, as well as basic meteorological information.

An example of a useful application of the comprehensive output file is for the generation of monthly average concentrations of hydrogen fluoride.

Hour-ending convention and hour labelling

ADMS 5 assumes an hour-ending convention in its input files. So, for example, meteorological data with an hour label of 15 should represent the average conditions between 14:00 and 15:00 (local solar time) of that day.

It is possible to use either a 1–24 or 0–23 hour labelling in these input files. However, the hour-ending convention means that any data labelled hour 0 actually corresponds to the last hour of the previous day. This is particularly important if using time-varying emission factors from a *.fac* file (or from screen), as it means that any hour 0 in the *.met* file will actually use the factor for hour 24 of the previous day. Hour labelling should be consistent across all input files that contain the year, day, hour (e.g. *.met*, *.bgd*, *.var*).

ADMS 5 also uses an hour-ending convention in output files. So any output concentrations labelled hour 15 will represent average concentrations over the preceding hour (14:00-15:00). The hour labelling (1–24 or 0–23) in the output files will reflect the choice made in the .met file.

Interface tips

There are many shortcuts and alternative ways of entering, organising and viewing information in ADMS 5.

Files can be directly dragged and dropped into the interface. This includes the main input (*.apl* files), as well as other files such as meteorological (*.met*) and time-varying files (*.var* and *.fac*).

On the Source screen, all the information for a source can be duplicated by right-clicking on the cell containing the source name. This context menu also contains the option to view a particular source in the Mapper. In the Mapper itself, there is also the functionality to drag and drop a wide variety of files.

Roughness file issue

An issue has been identified in which, on very rare occasions, a divide-by-zero error can occur when using a spatially varying roughness (.ruf) file. This issue will be fixed in the next version of the model (ADMS 6). However, if you experience this issue before then, it has been found that changing the maximum value in the roughness file very slightly can help to avoid the error.

Recent Publications

Stocker J, Carruthers D, Kalisz C, Paine R, Seaton M, Smith S and Warren C, 2019: *Evaluation of explicit NOx chemistry methods in AERMOD using a new compressor station dataset*. Guideline on Air Quality Models: Planning Ahead, Durham, North Carolina, USA, March 2019. Article online

Stocker J, Price C, Johnson K, Doktorova J, Rubinis J, Patel R, Seaton M and Carruthers D, 2019: *A Study of odour metrics and models using a comprehensive measurement campaign dataset*.19th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes, Bruges, Belgium, June 2019. Article online

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

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-Roads and Roads-Extra

Local scale air quality modelling including road and industrial sources

ADMS-Urban

Urban scale modelling including roads, industrial and diffuse sources

ADMS-Airport

Urban scale modelling with detailed treatment of aircraft emissions

GASTAR

Modelling emergency releases of dense gases

FLOWSTAR-Energy

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

ADMS-STAR

Short-term accidental release modelling

For custom-made software solutions, visit www.cerc.co.uk/research or email 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 related to complex atmospheric flows and air quality

For more details, visit www.cerc.co.uk/consultancy or email CERC.

Contacting the helpdesk

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

- From the ADMS 5 interface, select Help, Email CERC
- Email help@cerc.co.uk