

ADMS 3 (US) : Notes for the user

1. Meteorological input file converter

A utility CONVMET.EXE has been developed to convert US meteorological data files into files suitable for input to ADMS. The input data must be in one of two formats - a surface met measurement file (*.SFC) or a NOAA/NCDC data file (*.DAT). The output files are the *.MET file, giving the met data in ADMS format, and the *.RPT file, giving information about the conversion. These are described in detail below. Two example input files, EX_DAT.DAT and EX_SFC.SFC, and the corresponding output *.MET files, EX_DAT.MET and EX_SFC.MET are supplied with the converter.

i) Converting surface met files (*.SFC)

The *.RPT file lists the range of roughness lengths Z_0 and the heights of the wind measurements Z_u in the input data. (These parameters are not included in ADMS format *.MET files, but are input directly in the ADMS interface.) The header line at the start of the *.SFC file is reproduced at the start of the *.MET file. There then follows a list of the variables included in the *.MET file, followed by the data. The variables included in the *.MET file are as follows.

YEAR	Year
MONTH	Month
DATE	Day of the month
DAY	Day of the year
HOUR	Hour of the day (Note that the hours of the day run from 1 to 24 in *.SFC files, but from 0 to 23 in ADMS format files)
FTHETA0	Surface heat flux (Wm^{-2})
RECIPLMO	Reciprocal of the Monin-Obukhov length (m^{-1})
ALBEDO (M)	Surface albedo
U	Wind speed (ms^{-1})
PHI	Wind direction (degrees measured clockwise from North)
T0C	Surface temperature ($^{\circ}C$)

ii) Converting NOAA/NCDC data files (*.DAT)

The input *.DAT files are created by extracting data from an archive CD. When extracting the data, it is possible to choose which variables to include in the *.DAT file. In order to convert the data to ADMS format, it is necessary to include the following variables in the *.DAT file, in metric units.

Station ID (automatically included)

Time (automatically included)
Sky cover
Dry bulb temperature
Relative humidity
Station pressure
Wind direction
Wind speed
Hourly precipitation

Extra data may be included in the *.DAT file, but will not be included in the output *.MET file.

The station ID is reproduced at the start of the *.MET file. There then follows a list of the variables included in the *.MET file, followed by the data. The variables included in the *.MET file are as follows.

YEAR	Year
MONTH	Month
DATE	Day of the month
DAY	Day of the year
HOUR	Hour of the day (Note that the hours of the day run from 1 to 24 in *.SFC files, but from 0 to 23 in ADMS format files)
U	Wind speed (ms^{-1})
PHI	Wind direction (degrees measured clockwise from North)
CL	Cloud cover (oktas)
T0C	Surface temperature ($^{\circ}\text{C}$)
RHUM	Relative humidity (%)
P	Precipitation rate (mm/hr)

2. Wind sector size

In statistically analysed meteorological data sets, the wind direction is 'binned' into sectors. In the UK the sector size is 30° , but in the US a sector size of 22.5° is used. The US version of the ADMS 3 code therefore assumes a sector size of 22.5° for statistical data.

It should be noted that the wind rose viewer, accessible from the interface, was developed assuming a wind sector size of 30° or 10° (appropriate for UK statistical or sequential met data respectively). Hence the wind roses produced from US statistical data with 22.5° wind sectors may be misleading.

3. Output of highest concentrations

The US version of ADMS 3 generates extra output giving the 1st to 5th highest concentrations predicted for each pollutant at each receptor point, with the associated met line number. The user can then trace the met conditions producing these concentrations by reference to the *.MOP file or input *.MET file. The data is saved in the *.HST and *.HLT files, for short term and long term calculations respectively. An example *.HLT file is attached (Figure 1). Results are given for each pollutant (for each group of sources in turn if the 'Groups' output option is chosen) Results for gridded output are presented in tabular format, followed by a list of the results for specified points. Note that

- i) If the met line number given is '-999', the concentration never exceeds zero.
- ii) For time-dependent puffs, ADMS 3 calculates concentrations at a number of output timesteps. The concentrations given in the *.HST file in this case are the maximums over all timesteps, and the time is output alongside the met line number.
- iii) For long term calculations with an averaging time of up to 1 hour, ADMS 3 resolves the wind direction into n directions (where n is 5 if statistical met data is used and 3 if sequential) and calculates separate concentrations for each direction for use in the percentile calculations. The concentrations given in the *.HLT file are averages over the n directions, and hence may differ from the percentile results given in the *.GLT file. For example, the 'highest' concentration at a particular point may be less than the 100th percentile concentration.

4. Terrain data

Two supplementary terrain data files are supplied – Dunder.ter, giving data for Dunderburg Mountain, and StHelens.ter, giving data for Mount St Helens. The terrain data is shown in Figures 2 and 3. Two example .APL files using these terrain datasets are included on the installation CD (Dunder.apl, StHelens.apl). (NB: The terrain data for Mount St Helens was initially supplied in 7-figure co-ordinates. However, ADMS treats a maximum of 6-figure co-ordinates, so the first figure has been omitted.)