

Running experiments from *Air pollution in hills from the proposed Gloucestershire incinerator*

Files

The zip file contains the following files:

aermap.exe	AERMOD programs
aermet.exe	
aermod.exe	
bpipprm.exe	
Convertmap.java	Utility program to convert input list of places and coordinates to an AERMAP input file
Convertmap.class	
Convertout.java	Utility program to convert final AERMOD output to list of places and the predicted annual mean concentration of NOx at each place
Convertout.class	
aermet1.inp	AERMET input files: one for each phase of AERMET
aermet2.inp	
aermet3.inp	
aermod.inp	AERMOD input file
building.inp	BPIPPRM input file defining incinerator building
3418-4024.dem	Terrain data for 70x70km square with SW corner 340000,180000
upperair.dat	Upper air data for year ending 30/06/2015
onsite.dat	Weather data for year ending 30/06/2015
glosplaces.txt	List of towns and villages in 60x60km square centred on incinerator
nearplaces.txt	List of places very near incinerator
beechwoods.txt	List of selection locations in Cotswold Beechwoods
run.bat	Batch file to run experiments

Running experiments

The experiments can be run by the DOS commands:

```
run nearplaces.txt
run glosplaces.txt
run beechwoods.txt
```

How they work

run.bat contains the following sequence of commands:

```
java Convertmap %1
aermap
copy aermet1.inp aermet.inp
aermet
copy aermet2.inp aermet.inp
aermet
copy aermet3.inp aermet.inp
aermet
aermod
java Convertout %1
```

For the example of `glosplaces.txt`, the effect of each step is explained below:

Files used	Command	Files created
<code>glosplaces.txt</code>	<code>java Convertmap glosplaces.txt</code> Converts list of locations to an AERMAP input file.	<code>aermap.inp</code>
<code>aermap.inp</code> <code>3418-4024.dem</code>	<code>aermap</code> Uses terrain data to compute elevation and “hill scale” of all locations (receptors) and elevation of incinerator (source).	<code>source.txt</code> <code>receptors.txt</code>
<code>aermet1.inp</code>	<code>copy aermet1.inp aermet.inp</code> AERMET has three phases but input file for all three phases must be named “ <code>aermet.inp</code> ”.	<code>aermet.inp</code>
<code>aermet.inp</code> <code>onsite.dat</code>	<code>aermet</code> Runs first phase of AERMET: processes weather data.	
<code>aermet2.inp</code>	<code>copy aermet2.inp aermet.inp</code>	<code>aermet.inp</code>
<code>aermet.inp</code> <code>upperair.dat</code>	<code>aermet</code> Runs second phase of AERMET: processes upper air data.	
<code>aermet3.inp</code>	<code>copy aermet3.inp aermet.inp</code>	<code>aermet.inp</code>
<code>aermet.inp</code>	<code>aermet</code> Runs third phase of AERMET: merges output of previous phases.	
<code>aermod.inp</code> <code>source.txt</code> <code>receptors.txt</code>	<code>aermod</code> Runs AERMOD to compute concentrations of NO _x at all receptors.	<code>plot.txt</code>
<code>plot.txt</code> <code>glosplaces.txt</code>	<code>java Convertout glosplaces.txt</code> Converts AERMOD output to a meaningful form, by showing place names (or absolute grid references) instead of the relative coordinates used by AERMOD.	<code>out-glosplaces.txt</code>

In addition to those shown, the AERMOD programs produce numerous other output files.

Building downwash

To change the building height or shape, edit the file `building.inp` and run:

```
bpipprm building.inp building.out building.txt
```

and then copy the 30 lines beginning “SO” into `aermod.inp`, replacing the existing 30 lines in that file.

To remove the building, delete the 30 lines beginning “SO” from `aermod.inp`.

Different models

To ignore terrain, edit `aermod.inp`: change “ELEV” to “FLAT” in line 3.

To use the non-default options such as “LOWWIND3”, append “ BETA LOWWIND3” to line 3 of `aermod.inp`. Similarly for “LOWWIND1” and “LOWWIND2”.

Site characteristics

Site characteristics are defined on the lines beginning “SITE_CHAR” in `aermet3.inp`. The last three numbers are albedo, Bowen ratio, and roughness length, respectively. Change these to any desired values.

