

Try Me First Sample Run

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Overview of the Step-by-Step Instructions

The "Try Me First" Sample Run is designed for the novice to set up and *successfully* run an AERMOD sample run.

The "Try Me First" Sample Run is simply a “plug and crunch” example to familiarize the user with how to set up and run AERMOD in a generic sense. People who "learn by doing" can gain a familiarity with what AERMOD is like when running, and that will be of use when reading the documentation.

You will work in a command prompt window and a Windows Explorer window. There will be AERMOD files there: the executable, the input files, and the output files. You will run AERMOD and watch it process a short run. Afterwards, you can examine the output files, and you can run AERMOD again.

One important note: Here, the words “directory” and “folder” are interchangeable, because they mean the same thing.

Another important note: This document presumes that the user is working on a Windows computer platform. The instructions for other platforms would be a little different.

Step-by-Step Instructions

1. Open Windows Explorer and move to the Desktop.

You will work in the Windows Explorer window first.

Press the “Windows” key, which is usually between the left-hand Control key and the left-hand Alt key. While holding that Windows key down, tap the key for the letter “e”.

The result should be that a Windows Explorer window opens up. In that window, double click on the item named “Desktop”.

The result should be that the window displays the files and folders that are on the user’s desktop.

2. Open a Command Prompt.

You will work in the Windows Command Prompt window, too.

Opening the Command Prompt window on Windows usually is just a matter of clicking the File menu in the Explorer window. "Cmd Prompt" is an item there. If it is disabled (that is, shown in a grey color, or is there but does nothing when invoked), you may be in a part of the computer where you aren't supposed to change anything. Go to your desktop or your home directory.

(An alternative way is to use the Start button. In the latest Windows, such as Windows 10, click on Start and then type "C"; "Command Prompt" may be displayed as an option. In earlier Windows, follow the sequence "Start", "All Programs", "Accessories", "Command Prompt".)

In the Command Prompt window, you may need to give the commands to go to the Desktop folder.

Let's say that the Command Prompt window starts up in the folder C:\Users\ALincoln. The Command Prompt window opens and displays the text:

```
C:\Users\ALincoln>
```

There is a line that starts with the text "C:\Users\ALincoln", which states that the current folder is on the drive "C:" and is the folder "\Users\ALincoln". The "greater than" symbol, ">", is there to be like an arrow, an indicator that the computer is waiting for the user to type in something.

Let's say that we do not want to be in this folder. Instead, we need to go to the user's desktop and make a subfolder named SampleRun, and then use that subfolder.

In the following, this text will give you the commands to perform tasks, as well as giving you some file names. Please do not worry about capital letters and lowercase letters. In Windows, the case of the letters will not matter in this document.

The desktop is the folder "\Users\ALincoln\Desktop". To go there, one would type:

```
cd C:\Users\ALincoln\Desktop
```

and then press the Enter key.

The Command Prompt window then contains the text:

```
C:\Users\ALincoln> cd C:\Users\ALincoln\Desktop  
C:\Users\ALincoln\Desktop>
```

Now, we are on the desktop, in the Desktop folder.

We need to make a subfolder. It would be good to name it SampleRun. To make that subdirectory and go down into it, one would type (pressing the Enter key at the end of each line):

```
mkdir SampleRun  
cd SampleRun
```

The Command Prompt window then contains the text:

```
C:\Users\ALincoln> cd C:\Users\ALincoln\Desktop
C:\Users\ALincoln\Desktop> mkdir SampleRun
C:\Users\ALincoln\Desktop> cd SampleRun
C:\Users\ALincoln\Desktop\SampleRun>
```

Returning to the Windows Explorer window, we should find the subfolder "SampleRun". This may require scrolling up or down in the window. Once found, double click on the subfolder's item, and the Explorer window should show the subfolder. At this point, Explorer may state "This folder is empty."

3. Getting the ZIP file

At this point, where you are reading the "Try Me First" Sample Run itself, then you may already have gotten the ZIP file that it came in. If you have gotten the ZIP file from the SCRAM site, you can skip to the next section.

Otherwise, use a browser to go to the [EPA's SCRAM web site at http://www.epa.gov/scram](http://www.epa.gov/scram). There, under "Air Quality Models", find the "Dispersion Modeling" link and click it.

There, find the link for "Preferred/Recommended Models" and click that.

Then, you can find the link for the "AERMOD Modeling System", so click that.

In that section, you will find a subsection named "Installation Guide (Sample Run)". Be sure to click for, and read, the "Read Me (TXT)" file.

Then, these instructions are reached with the "Sample Run Instructions (PDF)" link.

Finally, the "Sample Run (ZIP)" link is the link for the "Try Me First" Sample Run. Clicking that should start a download of the ZIP file to your computer.

If you are asked whether to open or save the ZIP file, click the little arrow next to the Save button, select the "Save As" option, and save it to the SampleRun folder you have just made.

At this point, the user is done with the web browser and can close it.

4. Unzipping the ZIP file

If you have gotten the ZIP file from the SCRAM site and unzipped it, you can skip to the next section.

Find the ZIP file in the Explorer window. (Not the Internet Explorer window; the Explorer window can be called "My Computer" or "Computer" or "This PC".)

Unzipping on Windows usually is just a matter of double clicking the file in the Explorer window. That opens the zipped file.

In the zipped file's "unzipped window", there is a list item with the name "SampleRun" followed by the word "Folder" near each other. Double click the word "Folder".

The resulting list is the contents of the "unzipped SampleRun subfolder". Pressing control-A selects all the items in the "unzipped SampleRun subfolder" folder. Then drag all the items from the zipped folder onto your Windows Explorer window of the SampleRun folder.

At this point, the user is done with the "unzipped SampleRun subfolder" window and can close it.

5. Examining the Input File AERMOD.INP

At this point, you can use your text editor to examine the AERMOD.INP input file. Or you can simply use the command "type aermod.inp" followed by a vertical bar, followed by the command "more":

```
type aermod.inp | more
```

and page through the file with the Space bar. You can stop it any time with control-C.

There are lines like "CO STARTING" and "OU STARTING". The AERMOD.INP file is divided by lines like these, into six sections called "pathways". You don't need to understand them at this time, but it is interesting to notice things in the file. (This step-by-step tutorial will refer back to what is mentioned here.)

6. Executing AERMOD

AERMOD was designed to run from a Command Prompt window. One reason one could want to run AERMOD from the Windows Command Prompt is to receive any error or success messages during the run.

Type

```
aermod
```

and press Enter. You can pay attention as it runs. You should find that it outputs these six lines:

```
+Now Processing SETUP Information
+Now Processing Data For Day No. 61 of 1988
+Now Processing Data For Day No. 62 of 1988
+Now Processing Data For Day No. 63 of 1988
+Now Processing Data For Day No. 64 of 1988
+Now Processing Output Options
```

That tells you that you ran it correctly.

7. Examining the Output Files

At this point, you can use your text editor, or the “type aermod.out | more” command, to examine the output file AERMOD.OUT .

The first thing you can notice is that the very beginning of the AERMOD.OUT file is an exact copy of the AERMOD.INP file that you examined earlier. Then, after that comes a lot of pages with the numbers that AERMOD has produced.

Another output file that may have been created is ERRORS.OUT . Warnings and errors will wind up here, so one should pay attention to this file.

Again, it is all right if this isn't clear just yet, as long as you are getting some familiarity with what an AERMOD run is like.

Additional Step, the “Sample AERPLOT Run”

An AERMOD run can also provide a visual mapping of receptors for “earth browsers” like Google Earth. For a ‘sample run file’ for AERPLOT, go to the “AERPLOT Sample Run”.

Setting up for repeated runs and running the testcases

How Batch files work

When users are executing lots of different AERMOD runs, they have found it helpful to organize the AERMOD.INP files with different names.

As an example: Instead of always using the name AERMOD.INP, a run to be called "My Run" could be defined by using the name MYRUN.INP . Then it could be run with the following three commands, which produces the AERMOD.OUT file and copies it to MYRUN.OUT :

```
copy myrun.inp aermod.inp
aermod
copy aermod.out myrun.out
```

Actually, this would make a very good, and short, Windows Batch file. We could give it the name RUN-MYRUN.BAT, and run it in the Command Prompt window with the command:

```
run-myrun
```

(But note that every time it runs, it overwrites any file name AERMOD.OUT or MYRUN.OUT .)

At this point you have run the "Try Me First" Sample Run. You can run it again multiple times, if you wish, before moving on to reading the AERMOD documentation.

Running by double-clicking in Windows Explorer

Another way to run the RUN-MYRUN.BAT file is to locate it in the Windows Explorer window, and then double click it. A new Command Prompt window opens and closes quickly, evidence that the AERMOD program ran.

Experienced users might go into Windows Explorer, and double click on AERMOD.EXE . If there is no AERMOD.INP ready, that would result in a window that would blink open and shut with no indication of anything happening. That did run AERMOD but gives no idea of whether it was a successful run or not. But if there was an AERMOD.INP available, the run could be successful.

In short, this RUN-MYRUN.BAT file would take care of that.

How this applies to the RUNTESTS.BAT file

That is, how this applies to the TestCase folder's RUNTESTS.BAT file

The AERMOD section on SCRAM has a set of testcases in a ZIP file. AERMOD's distribution comes with sets of tests in a folder. Each has a Windows Batch file named RUNTESTS.BAT . Here is an excerpt from it; If you read through the example in the "How Batch Files Work" section, you will recognize the structure:

```
copy psdcred.inp aermod.inp
aermod
copy aermod.out psdcred.out
copy scimtest.inp aermod.inp
aermod
copy aermod.out scimtest.out
copy testpm10_1986.inp aermod.inp
aermod
copy aermod.out testpm10_1986.out
copy testpm10_1987.inp aermod.inp
aermod
copy aermod.out testpm10_1987.out
copy testpm10_1988.inp aermod.inp
aermod
copy aermod.out testpm10_1988.out
copy testpm10_1989.inp aermod.inp
aermod
copy aermod.out testpm10_1989.out
copy testpm10_1990.inp aermod.inp
aermod
copy aermod.out testpm10_1990.out
```

Each three-line chunk runs a different case and puts the results in a separate file. The user can give the "runtests" command, and dozens and dozens of tests run by themselves.

(If you wish to retrieve the testcases, go to the Appendix "Retrieving the TestCases" for that.)

Appendices

Appendix: Important Note on AERMOD Use

The use of AERMOD requires a user to read the manuals and in particular, to understand what they are trying to convey. The "Try Me First" Sample Run is simply a "plug and crunch" example to familiarize the user with how to set up and run AERMOD in a generic sense. Any understanding needs to come from reading the guides.

PLEASE READ AND UNDERSTAND WHAT IS IN THE USER'S GUIDES AND MANUALS!!!!

We cannot emphasize this enough. AERMOD and its supporting systems are complex and do not lend themselves to "plug and crunch", except in this example.

Appendix: Regarding Older Versions of AERMOD

If you have older versions of AERMOD, please delete the AERMOD.EXE so that if it is an older version, it does not make its way into being used in a production run.

Appendix: Normal AERMOD Installation Help

Each part of the AERMOD modeling system (e.g. AERMAP, AERSURFACE, AERMET, etc.) should be stored in its own subdirectory. The output from each segment of the system, such as the meteorological data or land characteristics, will need to be copied to the subdirectory where the user's AERMOD run will be executed. Path names can sometimes be used to point back to where the data is located and therefore, the data does not have to be copied to the executable's subdirectory. Input to each executable has to be renamed or copied to the basic file name of the executable. For instance, when executing an AERMOD run, "myinputfile.inp" has to be renamed to "AERMOD.INP". The output file will be AERMOD.OUT and will have to be renamed to "myoutputfile.out" or it will be over written next time AERMOD is run. It is important to read each User's Guide for any variations that do not follow this generic procedure. This helps us to make AERMOD compatible with other Operating System environments.

It is advisable to create a general overall subdirectory for each project with subdirectories for each part of the AERMOD modeling system. This way it will be easier to back up your project by copying the main project subdirectory and all its underlying subdirectories.

Appendix: Windows DOS Prompt Commands

Here are some sample DOS commands to enter at the Command Prompt (>).

This table is a list of all the Windows DOS commands used in the document's text, plus some more. The first column is the command. The second column contains descriptive information about the command.:

Command	Explanation
cd \	takes you to the top directory in whatever drive you are on
cd \document*	takes you to the "documents" subdirectory (earlier Windows, the "documents and settings" subdirectory)
copy file1 file2	copies the file contents of file1 to file2 (e.g. copy aermod.out aertest1.out)
mkdir foo	creates the subdirectory foo
del file	deletes the file
rmdir foo	deletes the subdirectory foo (may have trouble if not empty)
more	Adding the vertical bar and "more" will page the output of the existing command

Appendix: AERMOD File Extensions

This table is a list of the file types used by AERMOD. The table is a quick reference to be used in identifying the files that can be found in the AERMOD program's folder before and after the AERMOD run. The first column is the extension. The second column contains descriptive information about the extension.

Extension	Meaning
*.pfl	Upper level wind profile
*.sfc	Surface meteorological data
*.exe	executable file
*.inp	input file
*.out	output file
*.sum	summary file
Errors.*	File containing error messages generated during run attempt

The *.pfl and *.sfc files are prepared using AERMET. Land characteristics are part of the surface meteorological data file and the land characteristics are prepared using AERSURFACE. The output from AERSURFACE is incorporated with the meteorological data in AERMET.

Appendix: Comparing files in Windows

Programs to use

One can use the DOS FC command to compare file output. For example, at the Command Prompt, type:

```
FC aertest.sum aertest_org.sum
```

For another example:

```
FC aermod.out aertest_org.out
```

Alternatively, commercial and non-commercial text editors, such as Ultra Edit and Vim or Emacs, have their own File Compare functions that can be used instead of the FC command.

Date and Time Stamps will be Different

When AERMOD output files that are supposed to be the same *are* compared, the file of differences should only have lines containing date or time stamps. (Because the timestamps will be the only difference.) Some files should have no differences.

Different Numerical Formats for the same numbers

In numerical data, there might be cases where "0.00" is represented as ".00". These are the same number.

If the difference is the last digit, such as "1.45678" instead of "1.45677", the difference could possibly be not significant..

Comparison commands will find all such differences.

Appendix: Allocatable Arrays, Memory, Disk Space

The executables and source codes do not of themselves require much space. However, the models use something called "Allocatable Arrays" which adjust the variable array sizes to meet the needs for large receptor grids and other such variables which can also form additional large array sizes. Very large variable arrays can affect RAM memory to the point where the RAM memory cannot hold all the variable data. At that point, a run can be adversely affected by either stopping, crashing or by using the hard drive as a storage location (e.g. virtual memory). If the latter, performance will be drastically slowed as data is read onto and from the user's hard drive. Most AERMOD runs will not encounter this unless a large run is being performed on an older PC with minimum RAM memory. At this point, the run should be broken into separate runs.

Additional hard disk drive space is needed for the various input data sets. For instance, detailed terrain data input for an AERMAP run can approach 1 Gigabyte when used in preparation of 50 km radius AERMOD run. (Refer to the footnote after this paragraph.) It is advisable to create a general overall subdirectory for each project with subdirectories for each part of the AERMOD modeling system. This way it will be easier to back up your project by copying the main project subdirectory and all its underlying subdirectories.

(footnote: Details such as this can be covered in the next edition of the AERMOD User's Guide.)

Appendix: Retrieving the TestCases

Use a browser to go to the EPA SCRAM web site, <http://www.epa.gov/scram> . There, under "Air Quality Models", find the "Dispersion Modeling" link and click it.

There, find the link for "Preferred/Recommended Models" and click that.

Then, you will find the link for the "AERMOD Modeling System", so click that.

In that section, you will find a subsection named "Test Cases", just before the "Installation Guide (Sample Run)" subsection.

Be sure to click for, and read, the "Test Cases ReadMe (TXT)" file.

Finally, the ZIP file links are for downloading testcases. Clicking them should start downloads of the ZIP files to your computer. If you are asked to pick a place, try saving to your Desktop.

To unzip them, refer to step 4 in the main section of this document "4. Unzipping the ZIP file".

Appendix: If you run into problems

1. The AERMOD documentation is in the AERMOD Modeling System section on SCRAM. Refer to the "Retrieving the TestCases" Appendix for directions to that part of SCRAM.
2. We are available through the SCRAM web site "[Contact us" page,
https://www.epa.gov/scram/forms/contact-us-about-air-quality-models](https://www.epa.gov/scram/forms/contact-us-about-air-quality-models) .