In this next section instead of using the default map background we going to use shapefiles to add county map boundaries to the display. To start this example you should first redo the base case study of the aircraft flight, the original simulation that we did. If you still have this configured then you may proceed. Otherwise we should rerun the calculation first to ensure that we have the correct graphic. So go ahead and open up the set up run menu and we will retrieve the file that we had saved: conc_case_control.txt and for the advanced menu we need to do the same thing. I'm going to press reset here just in case, retrieve, conc_case_setup.txt and save. As you recall this is a short simulation of 11 hours duration, 5 km resolution grid, we're looking at the 900 m aircraft flight, and we will output just one time period, one hour average.

Run the model, and display, and you should have the 1000 m level set for display, the conversion factor for pg, the user set contours, and we might as well add the measured data to plot, which was data_case.txt and let's make sure this is the right answer, and indeed it is.

Now the map background that is used here in this graphic is relatively course. If you zoom in, you have a hint of it here, how course these background lines are, but it is defined in this file, in the graphics directory of HYSPLIT called arlmap. If I were to look at that file, graphics, here is the file arlmap. This is an ASCII text file which is just composed of vectors of latitude/longitude. Each vector is numbered. Some vector number one here, this is vector

number two, consisting of 99 points. And so first you have the 99 latitudes followed by the 99 longitudes.   And so each one of these factors represents a line on the map. You could easily edit this file and replace it with your own file, higher resolution, and there is some guidance in the graphics directory on how to do this.   The most common application is that people might add or delete boundaries that they do not want to see or you want to see on the map.

However another option is that within the graphics directory of HYSPLIT there is also a shapefiles directory. And this is a format, I guess it's a proprietary format and that it was developed by ESRI.   The information about this kind of the format can be found in some documentation as well, which is available also in that hysplit4/graphics directory.   Now for the tutorial, we've provided you with some sample files as well, not expanded, these are the files, the shapefiles that are provided here, in the tutorial and in the HYSPLIT directory are not ESRI generated files, but these are public domain shapefiles that can be downloaded over the Internet, and there are links available. Through a simple search you can find these repositories.

But what we're going to do is to get the HYSPLIT program, the display program to use the shapefile format background. We need to tell it to do that and the simplest way is if you go to the tutorial directory in the maps subdirectory, you will find a file here called shapefiles.txt. What I want you to do is copy this file, and place it in the

hysplit4/working directory.   This file contains a link or a least a record for each shapefile that you want to display. And in this case if gives the location of that, a number that represents the line spacing, the line thickness, and the RGB color fractions.   So you can control the plot this way. So to make the program use that instead, we go back to the display, in concentration, contours, and if the plotting program finds the shapefiles.txt file in the working directory, it will use that instead of the map background file to do a display.   And so, if you should've followed the instructions, and you should have this plot.   And you can see that there is much higher resolution and it includes county boundaries as well as major roads in this light brown color.

And in the subsequent sections that are coming up after this one, we will be doing additional things with this particular graphic, so do not delete the calculation.   And this concludes the generation of county map backgrounds.