In this section we will continue to test the HYSPLIT installation. Now we're going to look at the air concentration calculation which will be 2.3. So this is the section that we're going to be looking at and looking to start the same way as we did with the trajectory calculation.

So we're going to open up the run HYSPLIT icon, maybe you already have this open, and you are going to click on the concentration tab and we're going to set up the run. As you can see, this menu is very similar, almost identical to the trajectory set up menu for this particular calculation.

The only difference is that we are only going to be starting at one location. This is 40° North 90° West in the Central US, a hypothetical location. We're also going to run for 12 hours, and we're going to use the same meteorology file as before. But the menu here is slightly different in that it has

an additional bar, for setting up the pollutant, the deposition, and the grids. Now the air concentration calculations are similar to a trajectory calculation, but the main difference is that we are following hundreds if not thousands of particles, particle trajectories. Each particle would be representative of some mass of pollutant that's released. And then we would sum those pollutants over a grid. And that's what this particular menu bar permits you to do.

So for instance, the three things here are the pollutant configuration, we've only defined it for one pollutant right now, so if we click on the specie one button, you can see that we are releasing a test pollutant, has an emission rate of one unit per hour, we are not defining units at this point, and there is one hour of emission. As I mentioned with trajectories, zeros have special meanings. In this case the zeros

mean that the emission starts at the start of the model calculation.

If we click on the grids, we're defining a concentration grid that has a spacing of .05° of latitude and longitude, that happened to be centered over the release point. It has a span in latitude and longitude of 30° and the output will be written to a file called cdump. It will have one vertical level with a depth of 100 m. We are going to start sampling immediately at the beginning of the run and continue sampling until the end of the run, and we're going to sample in such a way to give us a 12-hour average air concentration. Click on save.

As far as deposition, this is just an inert gas that has no depositing properties. We're not really defining it as any kind of pollutant at this point, so all these entries are zero. So at this point if you click on save, what

happens is that it writes those GUI variables for this configuration into the file called default_conc.

And now when we run the model, it copies default_conc to CONTROL and then it executes the executable for air concentrations, which has a slightly different name, it's called hycs_std, the HYSPLIT Concentration Single processor standard version. The model runs a little slower because we're running many more particle trajectories, not just one.

Then we go back and we display the results. In this case we want to display concentration, we'll go over the other display options in a future section. But let's look at the simplest one, which is contours and this menu is similar to the trajectory plotting menu, that has of course more options. The output file from HYSPLIT, that it is reading is cdump. This is a binary file,

unlike the end points file which was ASCII. It's using the standard map background. We're not doing anything special with the mapping at this point, just letting it all default. The same way with the data itself, there's only one pollutant called test and only one level of a hundred meters, so there's nothing to select. And there are no multipliers involved here because we were not really assigning units or anything like that. Okay, so we're just leaving everything to the default value and we will be going over in more detail some of these menu options later on, but at this point just execute display. And you can see the results of this one hour release of particles, that we track for 12 hours and this represents the 12-h average concentration in units of mass per cubic meter and you can see the peak contour is right here by the source. If you right-click you can kind of zoom in a little bit, and that represents, ten to the minus 12th concentration units

per cubic meter and the layer of 0 to 100 m integrated over the period of 0000 to 1200 on the 16th of October 1995.

Now this is the basic calculation. It was very to the trajectories. It writes some of the similar files. If I were to look at the files, open up file explorer and go to the HYSPLIT4 directory under working. We just make a little room here. You can see that the default_conc file is the file that was written by the graphical user interface. And it has similarities to the trajectory default_traj in terms of the starting time, location, duration, meteorological data files, and so on. But then it has other options in terms of the pollutant being released, the concentration grid definition, and the deposition definitions. This file is identical to the CONTROL file that gets read by the model. Now when the GUI starts up again, what it does is actually reads default_conc. If I close the GUI, when it starts up it

actually reads that file and sets those parameters in the GUI.

This concludes the test concentration calculation section.