In section 7 we will start the air concentration calculations. Most of the items under section 7 are just a pedagogical exercise, where we will be learning about the different model options, how they affect the calculation, and the kind of results that you would see. The actual configuration of a real case will be started in section 8. The main difference between an air concentration calculation and a trajectory calculation is that in the trajectory we show the path following the mean wind as prescribed by the input meteorological data. Whereas in an air concentration calculation, we follow the path of hundreds if not thousands of particles, essentially a trajectory path is computed for each one of those, and then we look at the dispersal of the particles, or the particle density, to compute the air concentration. The main difference between the air concentration trajectory and a simple single trajectory is that in the air concentration calculation we add a turbulent component to the trajectory motion, the particle trajectory motion.

We will start this example by reconfiguring the test case. So go and open the graphical user interface and before we start, press the reset button, to ensure that we have the test case. This calculation, the test calculation, uses the sample data that is provided with all HYSPLIT installations. Open the concentration set up run menu, save, run model, and then display, concentration, contours, execute, and you should have the same result that you had earlier when we did the example right after installing HYSPLIT to insure that the model was working correctly.

So now let's configure this for the CAPTEX experiment, back to set up run and we need to enter the correct starting time, 83 09 25 17, and the Dayton location which you can select from the list. And we need to use the North American Regional Reanalysis data, so clear, add, it's in the tutorial/captex directory. Now, up to this point this menu is the same as a trajectory menu, it only contains an additional bar which I will review briefly, but we will going to this in more detail later. And it contains information about the pollutant, the sampling grid, the internal computational sampling grid, and any deposition that we might be doing. So there is only one pollutant defined, in this case we're calling it test. And the emission rate is one unit of mass per hour for a duration of one hour, starting at the beginning of the simulation. And we are laying out a concentration grid for sampling purposes during the computation, that is centered about the Dayton, Ohio, release point, and we know this because when zeros are in the center, when zeros are defined as the center of the grid, that means that the calculation uses the source point. We're defining the grid of 0.05° resolution in latitude and longitude, that is approximately 5 km, and the span of the grid, this domain, its coverage, is 30° in both latitude and longitude. And will output a file in the working directory of, a binary file of the air concentrations, which will be called cdump. It will have one level in the vertical going from the ground to 100 m. We will start sampling at the beginning of the model run and will continue sampling to the end of the model run, which is what the zeros mean in this case. Non-zero values would

be used if we defined them. And we will be computing an average, a concentration average, 12 hours and zero minutes, which as you recall was the duration of the simulation, 12 hours. At this point we are not defining any deposition, so all these parameters are zero. We will go into these menus in much more detail as we go on in other sections.

Go ahead and save, then run model, and then display, and you should get this result. And very briefly, it shows the source location here, that we have a concentration grid of zero to 100 m and a 12 hour average over this period. And these are the concentrations. Wow how are these computed? These numbers seem very small. We haven't really discussed this yet, but we actually followed 2500 trajectory's and each trajectory, each particle that we followed, would've contained 1/2500 units of mass. And as I was saying, if one particle of mass were contained in one grid cell, now one particle of mass, the mass of one particle rather, would be 1/2500. You know that we released a total of one unit of mass over 2500 particles. So if that one particle mass were mixed in a grid cell of 5 x 5 km and mixed through the boundary layer in the vertical, 1 km deep, the mass over volume would be about one in 10 to the -14 units per cubic meter. So the calculation at this point does not distinguish units, you define them, at this point we have not defined them, but we will going to that in more detail in subsequent sections.

And this concludes the discussion of the configuration of the test case for CAPTEX.