In the previous section we did a short range dispersion calculation using an orthogonal lat-lon concentration grid. However, short range calculations might be more appropriate on a polar coordinate concentration grid. In this kind of grid, the size of the grid cell, the concentration grid cell, increases with distance from the source, and it is defined by a sector angle, the angular difference between adjacent downwind sectors, and the increment, the distance increment, that the sectors along each arc are divided into. The one limitation of this approach is that it cannot be applied at very long-range distances because it does not account for the curvature of the earth. So as long as you can assume that the lines of latitude and longitude are orthogonal to each other, then this would be an appropriate configuration. So we're going to do the previous calculation again, but using a polar coordinate concentration grid. So regardless of whether you are continuing on from the previous section, or starting from scratch, go ahead and load the CONTROL file and the name list file for the Sagebrush experiment. If you do not understand the Sagebrush experiment, then go back and redo the previous section.

So let's go ahead and do a retrieve for Sagebrush and that would be in tutorial/sage, and also the same for the name list. So before we exit this menu remember that in the Sagebrush experiment we were outputting the density, that is, the mixing ratio, the mass mixing ratio, so we will leave that intact. But the only thing you really need to change is the concentration grid packing method in menu number eight. And we want to define it as a polar grid.

Now the way this menu works is you can have multiple grids in a single simulation and so you need to update the variable for each grid that you define. So in this case we select update and the CPACK variable is set to three for grid number one, and we're going to save and that was really all that's required.

Except we need to, of course, define the concentration grid properly. So if you open the grid menu, recall that the previous orthogonal grid was defined at approximately hundred meter resolution. So this, when you set that flag, the CPACK equals three variables, this changes, so that's the span now becomes 360°, so we're covering a circle, and we're going to cover it, we're going to go only downwind 5 km and that circle will be divided up into 360 sectors, so that means each sector will have a resolution of 1° and we're going to partition that downwind, at again at hundred meter increments, or .1 km. And we will change the output file name to something else so it doesn't conflict, and everything else can stay the same. And like I said, if you haven't done the Sagebrush example, go back to the previous section, and run model.

And you see there are two messages, one that we are outputting mixing ratio. In this case it will be grams per kilogram because we were releasing grams in the emission rate and we also defined a polar concentration grid for grid number one. Now when this run completes, there're really only a few programs that, a few of the post processing programs that can display polar concentration grids or work with polar concentration grids. There is a

plotting program and only two of the utility programs can work with polar grids. I mean in the future this may expand to other programs but right now they're only two and that would be the simple listing of the concentration file that uses the program CONREAD and the convert to ASCII utility, CON2ASC. So those are the only two post-processing programs that can work with these data, in addition to the special plotting program called, naturally POLEPLOT, for the polar grid plotting program.

And once the calculation has completed we can go ahead and do the display, and that's all I'm going to do here, display, concentration, and we have the tab for polar grids that will invoke the polar plot program. And there are different options in terms of color fill and contouring even, and let's go at the resolution we know we have, approximately 100 meters, for the Lat/Lon lines, for the mapping, we want to be similar to the grid. And then execute the display.

And it does take a little time because there are multiple frames, one every 10 minutes, and you can see the plots are a little different in that the base unit is 1×10^{-4} grams per kilogram and then these are multipliers, so the red would be 1×10^{-4}, the yellow region would be $.5\times10^{-4}$ grams per kilogram, so it goes down, and you can see the resolution here of the concentration, of the polar grid. And you can see it's a more natural fit for some, something like this. The other options, just, we can also contour the results, or we can contour or colorfill as well.

So I'm going to quit this and this actually concludes the polar grid section and the only thing that is left is an exercise, which we will discuss shortly.