

To complete the radiological section, we're going to do an exercise. In the previous dose calculation we used a 5 km concentration grid. Would the dose still be under-estimated if we used a finer concentration grid? The hint to do this problem is to just use the batch file, edit the grid resolution to finer values and let's see what results we get, and compare them with the previous section calculation.

Remember the highest doses were nearest to the source so that the concentration grid, in theory, could play a role, because if the particle distribution is very narrow, that is narrower than the size of the grid cell, then the concentration would be under-estimated.

So go ahead and pause the video and we'll come back and look at the results.

Alright to solve this, I suggest you just go to the tutorial directory, to batch files, and go to the custom dose one, which is the one that we just did, that was the previous section, and I'm going to open that in Notepad, and I'm just going to make two changes.

I'm going to change the resolution of the concentration grid from 5 to 1 km, and will also half the depth of the vertical grid and then just save this, and exit, and we can just run the batch file.

Now I didn't look to see the particle number that was set here. So however you did the calculation is fine and in

this case it's 12,000. I think we might originally did 24,000. Either one is valid. Obviously the more particles you release the better off you are.

And the script opens up the, first the dose file for air concentration, and we can see the numbers now are approximately 11 mSv for the air concentration. And the second frame is the dose for the ground shine and the number is 84 mSv. So these are much larger and I can't recall if I mentioned it before, but notice these squares, is rather large. So this represents a region that is comparable to this half degree, this is a half a degree distance here, of the meteorological grid cell. So we had wet deposition here and we had no wet deposition here. And we can zoom in and we do see the high values near the source. And if I were to close that and we can put them side-by-side, and you can see there is almost a factor of ten for the high value close-in and not quite that, a factor five maybe, for the ground-shine dose. So it does make a difference close-in, but notice the down wind patterns and the green region, the two millisieverts for instance, is about the same, so it really only affected the very close-in which is what we were expecting.

So this concludes exercise 15.