

## **DEM FILES**

DEM stands for Digital Elevation Map. These files contain topological data for various areas of the US. They come in a variety of resolutions. The lowest resolution data is provided in 1 arc-minute square meshes with 3 arc-second (~200 feet) horizontal resolution. These DEM files are available via ftp from the USGS at :  
<http://sun1.cr.usgs.gov/eros-home.html>

The USGS also provides a number of higher resolution files covering various areas of the country, but these must (currently) be ordered from the USGS at fairly stiff rates. I believe all of the files (even the ones you pay for) are freely redistributable...

DEM files are stored in a somewhat complex ascii format. These files can take a while to parse, and occupy a lot of disk space. So, rather than directly reading DEMs, NXPlot3d comes with a conversion program (demproc) which processes DEM files into a more compact form which NXPlot3d can read rapidly. The processed files take 75% less disk space than the unprocessed files.

To process a DEM, type 'demproc <infile>.dem <outfile>.pdem'. You will receive a string of diagnostics as the processing progresses. Demproc can deal with most, but not all DEM files. If you find a DEM that doesn't work with demproc, let me know so I can figure out what's causing the problem.

Load the converted PDEM file into NXPlot3d by selecting the 'DEM' radio button on the control panel. The mesh size (NX and NY) ARE used in DEM mode. A full 1 minute DEM file contains 1201X1201 data points. This is FAR too many points to display at an interactive speed, and many of the details would be lost anyway. So, while NXPlot3d LOADS the entire DEM, it only displays a subset at any given moment. At any given location in the mesh it will use the DEM point closest to that location. No smoothing or interpolation is done, so if you zoom in enough you will see a 'stairlike' display with discrete steps instead of a smooth surface. For interactive viewing an 80X80 mesh is pretty good. For final rendering you might want to up it as high as 200X200.

Zooming can be done via the density/contour plot as usual. Coordinates displayed are in degrees and fractional degrees. As a rule of thumb, 1 degree is ~50 miles (varies with latitude).

Important warning/disclaimer: If a data file contains a rotated mesh or and incomplete mesh, demproc may work properly, but the coordinates in the result may not be completely accurate. Demproc does it's best, but it is far from perfect at this point. It should read the standard USGS 1 minute files with no problem.