MapServer Investigations:

The purpose of investigating mapserver was to determine if it could be used for creating automated maps at specific scales for plotting to paper.

Given raster and vector data, mapserver can create an output map (jpeg, tiff, pdf). Given that pdf files can store both vector and raster data, it was determined that we would use pdf files as our format of choice.

The current version of mapserver (4.6.0) does not support raster images of more than 256 colours. Some modifications were made to mapserver, and it now accommodates 24 bit colour images.

Creating a pdf for printing:
In order to create a map at a specified scale and paper size, some calculations are needed. The following are steps to calculate values for input to mapserver:
1. Decide paper size we want to print. Ex. 12"x12"
2. decide scale. Ex. 1:50000
3. find out resolution of imagery ex. Imagemaps pro – 12.5m/pixel
4. calculate coverage in metres that paper size and scale will equate to. Ex. 50000x(12"x2.54/100) = 15240 m (so coverage is 15240m x 15240 m)
5. calculate # of pixels of image that is equivalent to coverage area. Ex. 15240m / 12.5m/pixel = 1219.2 pixels
6. since we can't make an image that is not an integer # of pixels, we round up to 1220 x 1220 pixels. However, this means the coverage area needs to be increased by 0.8 pixels. i.e. 12.5m/pixel * 0.8 pixels = 10 m. so the coverage is now 15250 x 15250 m
7. in the mapserver ".map" file, we specify the size of the image as 1220 x 1220 and add the extent xmin ymin xmax ymax (to cover the area of interest that is 15250 x 15250 metres)
8. run mapserver
9. Mapserver should produce a map that when printed onto a sheet of paper that is 12"x12" with no scaling, will be 1:50000 scale.

The steps that have been described above should produce a map that when printed with no scaling, should come out to 1:50000. However, this is not the case. For some reason, map server creates a pdf file that when opened in adobe acrobat reader shows that the map is 1.4 times the size of what our calculations have come out to be. i.e. acrobat says the map is ~ 16.8" x 16.8". This has something to do with the pdf file being created at 72dpi.

To resolve this problem, some more modifications have been made to mapserver. The user now must specify in the ".map" file under OUTPUTFORMAT, FORMATOPTION "PAPER_SIZE_X= "FORMATOPTION "PAPER_SIZE_Y= " the size of the paper to be printed on in inches. When this is done, mapserver will still create a pdf file that is 1.4 times larger than we expect, but the actual map (raster image and vector data) will appear

within the pdf file and only measure the correct height and width. The rest of the pdf file will just be blank (white space).

Normally when we produce maps, we have the image surrounded by a margin where we put information such as logos, legends, scalebars, and graticule labels. Mapserver does not have the option of putting margins around a map. In order to do what we want, we have to "fool" Mapserver into making margins by telling it that we have a map that is larger than it actually is. This works fine except when we put a graticule onto our map. Mapserver will automatically draw a graticule on the entire map (including the margins that we have fooled it into making). Creating white polygons around our "actual" map and overlaying it on the entire map can remove the extra graticule lines that are drawn into the margins. However, the labels for the graticules created by mapserver are drawn at the edge of the entire map. We want the labels to be drawn at the edge of the "actual" map. In order to fix this problem mapserver was again modified, and new parameters are required for input into the ".map" file. The new parameters are added into the FORMATOPTION and consist of the extent of our actual map extents (i.e. xmin, ymin, xmax, ymax).

This is all that has been done so far.