EECH Map creation help file

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01 Software required

First of all you will need to grab the following EECH editing utilities from this page: http://eech.robfox.net/downloads.html

- TED (Terrain EDitor) – TED.zip
- Border Generator – BorderGen.zip
- BED (map .Bin EDitor) – BED.zip
- TEG (TErrain Generator) – TerrainGen.zip
- Starshoy's guide to BED – BEDGuide.zip
- Simple terrain viewer – TerrainView.zip (Not strictly necessary but you might find it useful)

You will also need some software to manipulate the DEM (**D**igital **E**levation **M**odel) file that you will be downloading later.

Go to http://www.visualizationsoftware.com/3dem/downloads.html download and install the 3DEM software.

None of the EECH editing utilities listed above requires installing, so you can just unzip them into a folder somewhere on your PC.

02 DEM download

Next task is to go and download some DEM files so that you can start creating your own maps. These are available from quite a few places – one of the places I found most useful was the *Earth Science Data Interface (ESDI) at the Global Land Cover Facility* website here:

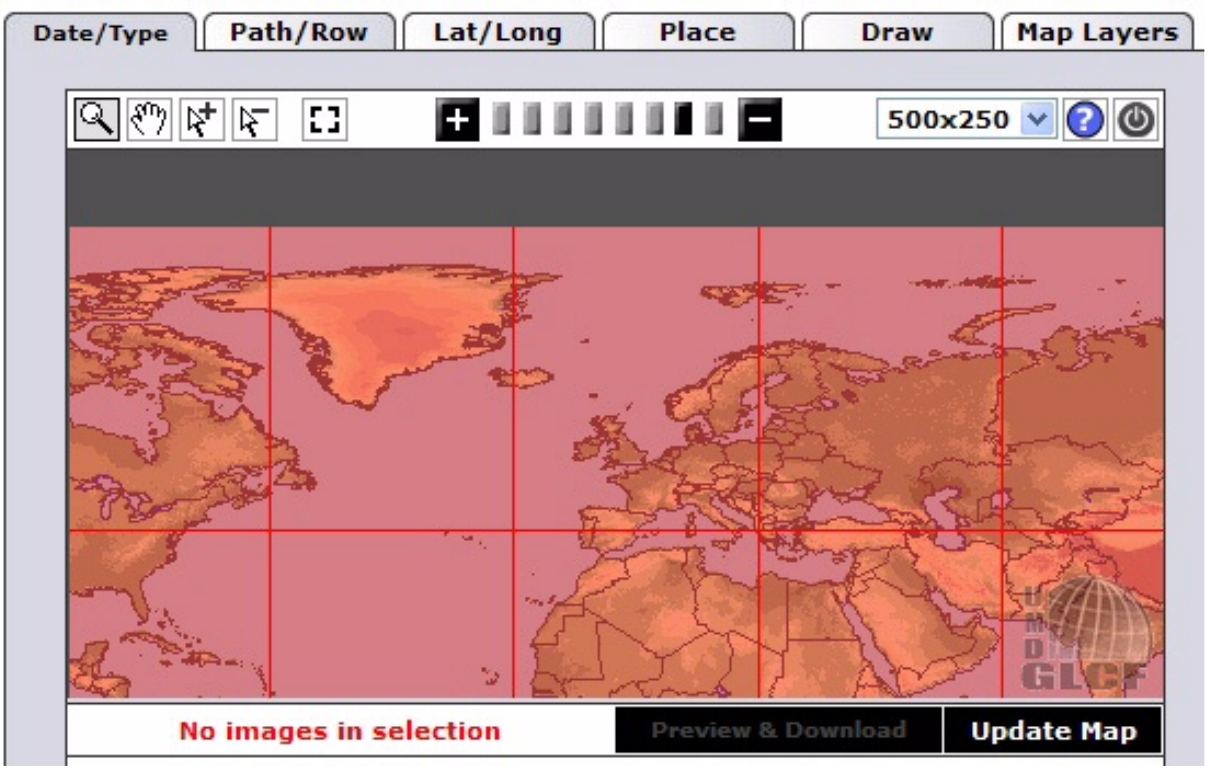
http://glcfapp.umiacs.umd.edu:8080/esdi/index.jsp

NB: There are many other places to get the data but the rest of the tutorial will use this site as an example as this is where I got mine from ☺

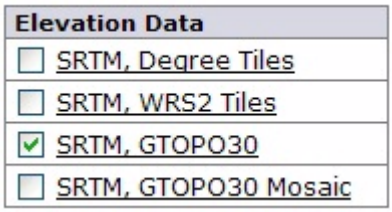
- When you arrive at the site click on the Map Search image (shown to the right)
- This will now take you to a map of the world

- Click on the area that you wish to use for your map and it will zoom in

- Once you have clicked a number of times you will notice a red grid has appeared. This indicates that the area is covered by a particular Map tile



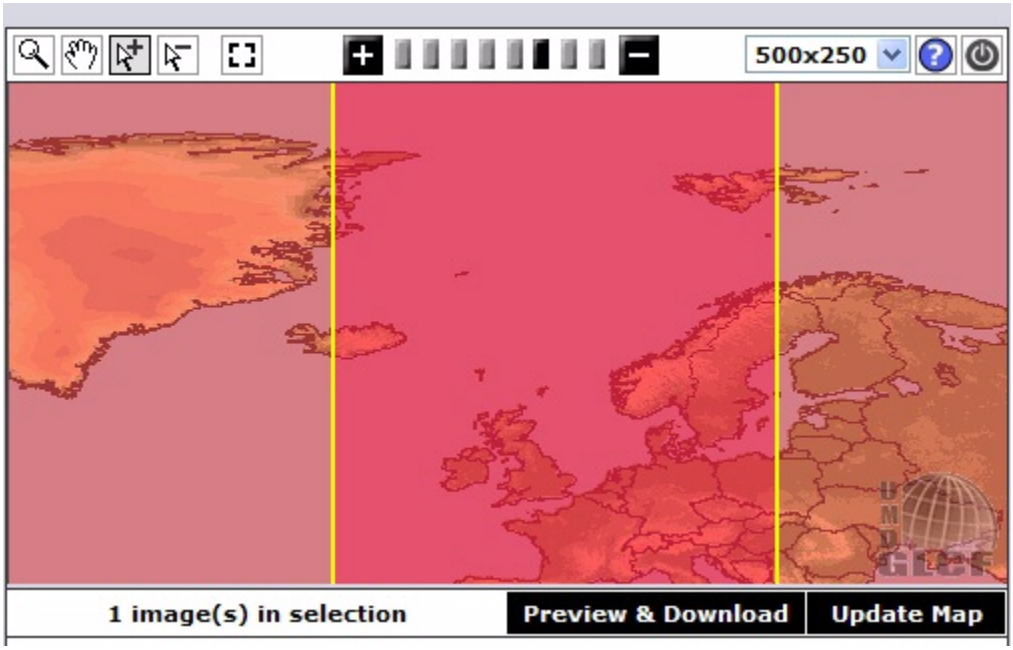
- On the left hand side there are several check boxes for selecting the data you require. I think the correct one is the SRTM, GTOPO30 format so ensure that you have checked this box (This format has worked for me…)



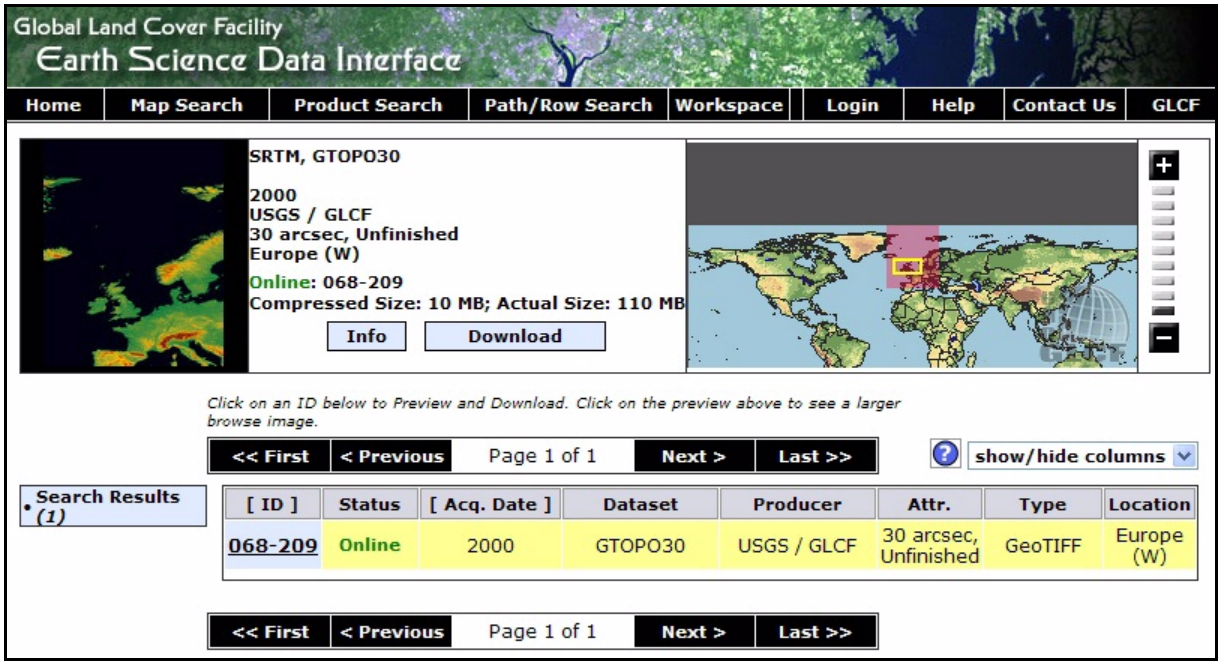
- Also notice in the example picture above the **No images in selection** text – this means that you have not yet selected any tiles for downloading

- To select a particular tile for downloading use either:
    - The arrow with the plus sign to left click and drag around the area you wish to select OR
    - Click on the dotted square box to select a tile (if more than one grid is visible on the map you will select all that are visible)

- The map will now change to show the selected tile (as shown below). Also note that the text will change to show how many tile images you have selected i.e. in the picture below the **1 image(s) in selection** text indicates that I have one tile selected

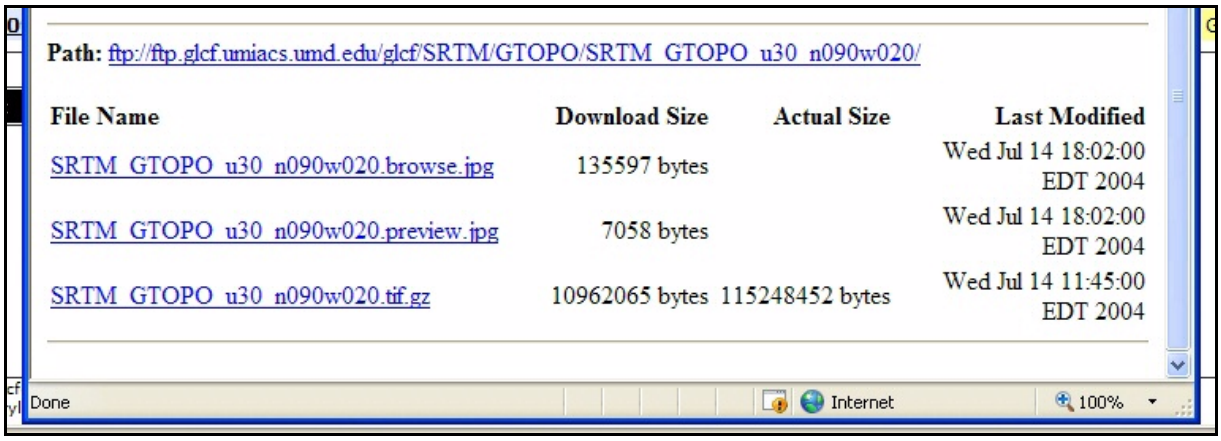


- You can now click on the **Preview & Download** button which will take you to the screen shown below which lists details about the selected tile including the download and unpacked file sizes



- Click on the Download button to go to the next screen. Where you can click on the .tif.gz file. This is a compressed file that contains the DEM TIFF. If you want to you can also save (either or both) of the preview picture files using the two .jpg file links:

- .browse file is a 640 x 480 JPEG picture
- .preview file is a 120 x 150 JPEG thumbnail



- Once the file has downloaded unpack the GeoTiff DEM file and remember its location as it will be needed for the next step

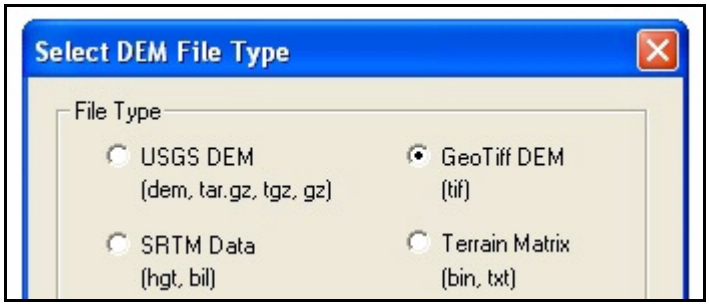
03 Opening the GeoTiff DEM in 3DEM

The reason the file needs opening in 3DEM are as follows:

- I think the Terrain Editor struggles with large files and you can use 3DEM to export just part of the map tile. This will create a considerably smaller file than the GeoTiff map tile you have just downloaded!
- You will need to get certain coordinates for use with the Terrain Editor

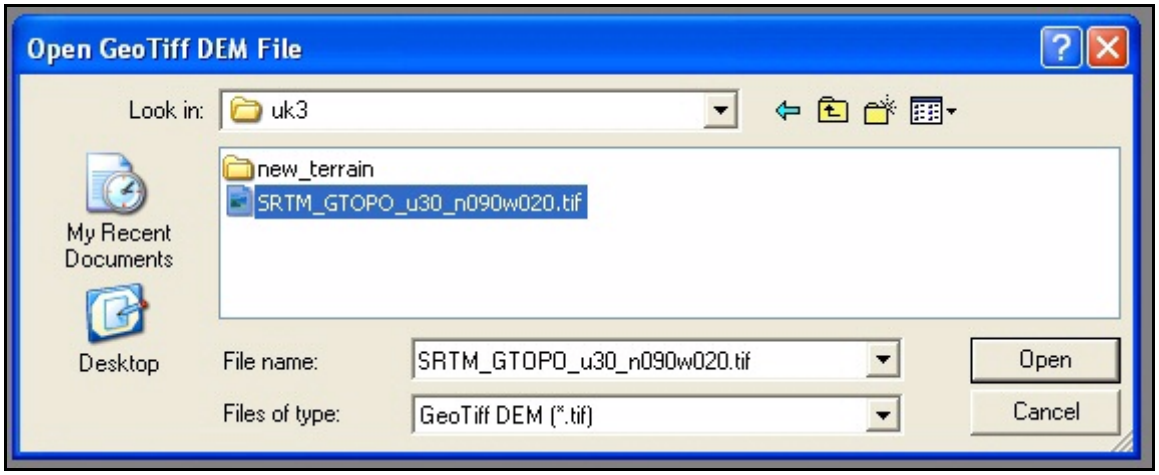
The process of gathering the information and exporting the DEM file is as follows:

- Start the 3DEM program and make sure that GeoTiff DEM is selected (as shown below)



- It will now ask you for the location of a GeoTiff DEM file

- Browse to where you unpacked the file earlier, select it and click on the **Open** button



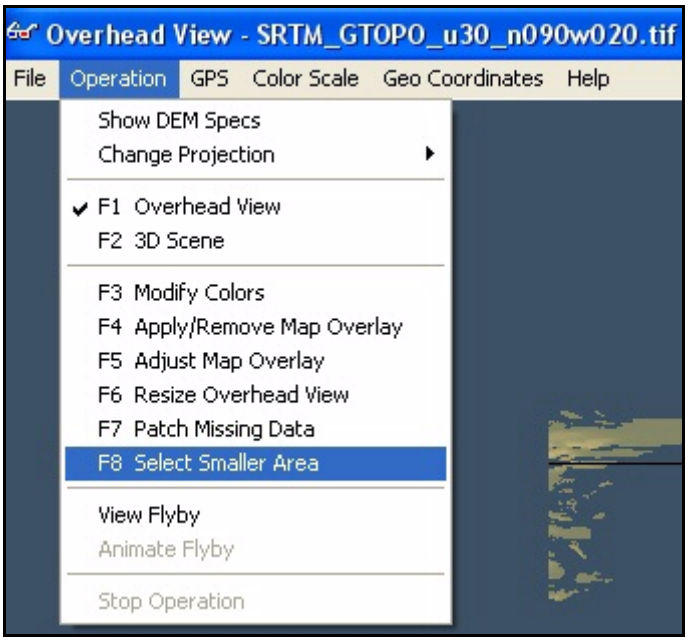
- 3DEM will now proceed to open up the GeoTiff file – it may take a short while to load so don't worry if the map does not appear immediately!

- Once it has finished loading you will be presented with a view of the tile you just downloaded

A) Export a smaller DEM file

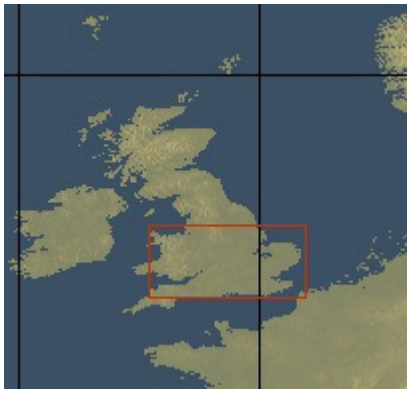
- First of all you need to select a smaller area of the map and to do this you can either:

    - Click on the *Operation* option (in the Menu bar) and choose *Select Smaller Area* OR
    - Click on the **F8** Windows function key



- Once you have done use your mouse to select a smaller area on the map

- This will be indicated by a red border that represents the selected area – press the **Enter** key when you are happy with your selection



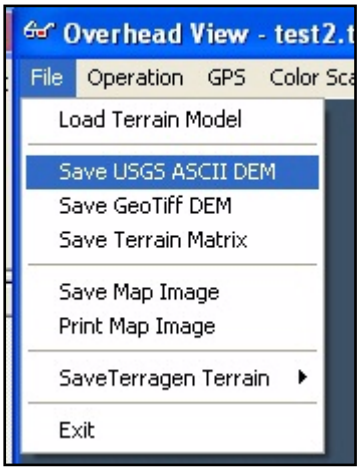
- The map will now change to display the smaller area

- You can continue doing this until you have the approximate area that you wish to base your map in

IMPORTANT: Ensure that the area selected is slightly larger that you plan to use for your EECH map

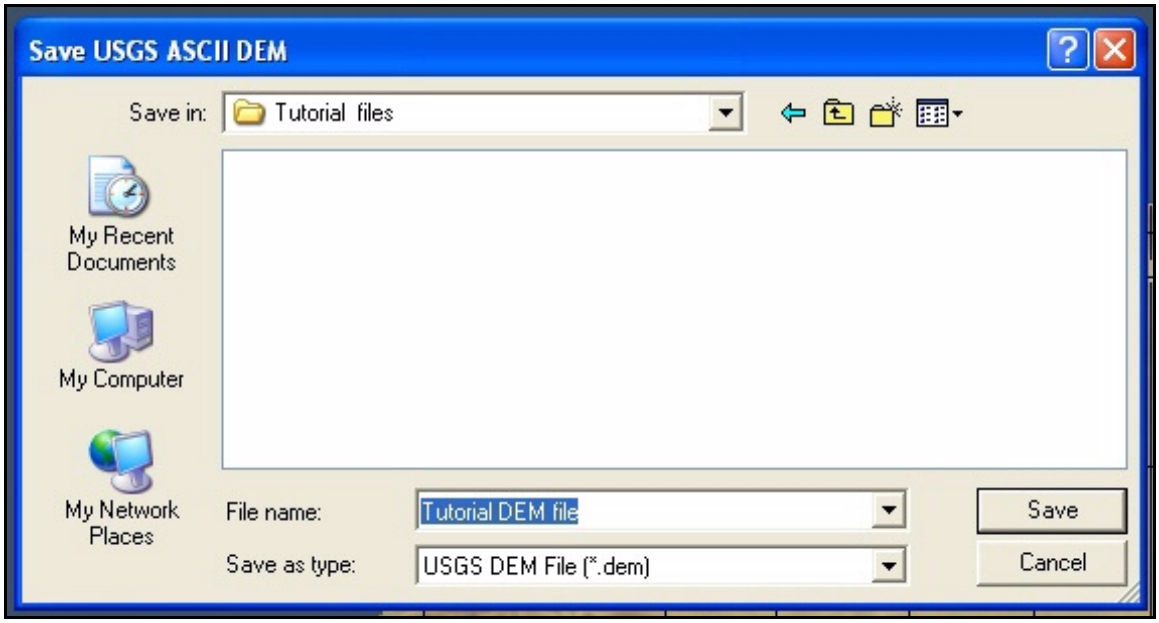
- Once you are ready, you can now export the data into a format that the Terrain Editor can use

- From the *File* menu select *Save USGS ASCII DEM* (as shown to the right)



- You will now have *Save USGS ASCII DEM* dialog box that will ask you for a location and file name for the .DEM file

- Browse to where you wish to save the file and type in a file name, then click on the **Save** button



B) Get the required information for the Terrain Editor

Once you have saved the .DEM file you will need to get the information that the Terrain Editor requires:

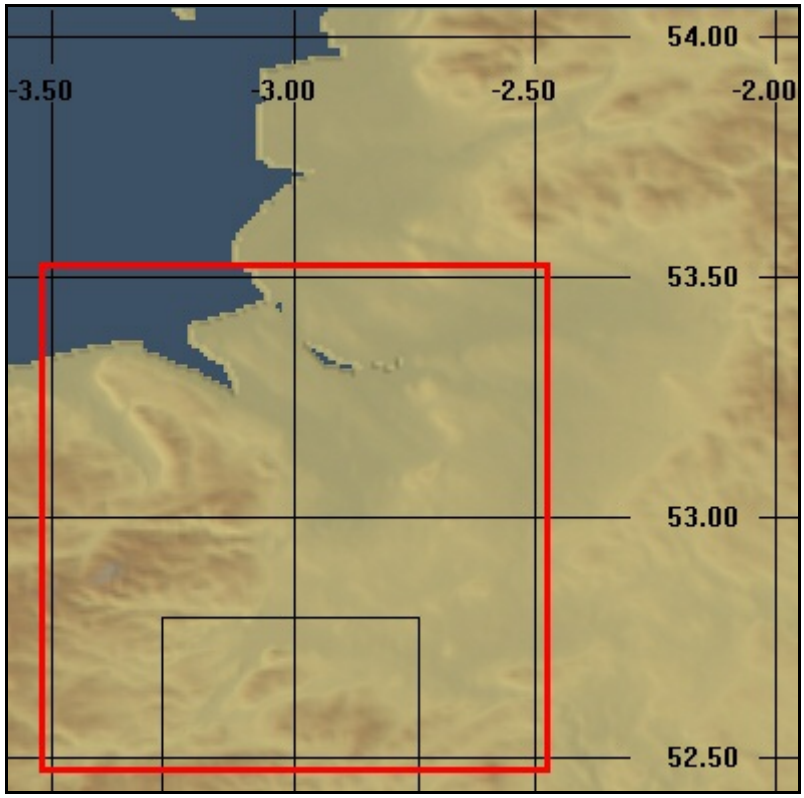
- In 3DEM there are grid lines that represent the lines of latitude and longitude

- These coordinates are required when converting a .DEM file to a .ELEV file using the Terrain Editor

- The South West and North East corners are required for the conversion

- These are needed in the latitude and longitude format and are obtained using 3DEM

- As an example in the picture below I wish to make my EECH map using the area represented by the red highlighted area



- So the values I will need for the Terrain Editor are as follows:
    - SW corner = Latitude: 52.50 and Longitude: -3.50
    - NE corner = Latitude: 53.50 and Longitude: -2.50
- Take a note of these values as they will be needed later on in the process
- If you require ones that are not on a gridline then in the bottom right hand corner of 3DEM there are coordinates displayed as you move your mouse pointer (along with Elevation information)

- You can change the format of the displayed information by clicking on *Geo Coordinates* (in the menu options) and then selecting the required format
- Degree Min Sec is the most useful option I think as this is the closest format to what the Terrain Editor requires
- You now have all the information that you require to start using the Terrain Editor

04 Using the Terrain Editor (TerrainEd.exe)

The next stage of the process is to bring the smaller DEM (that you created earlier) into the Terrain Editor for conversion and add additional features that make up a Terrain Editor map:

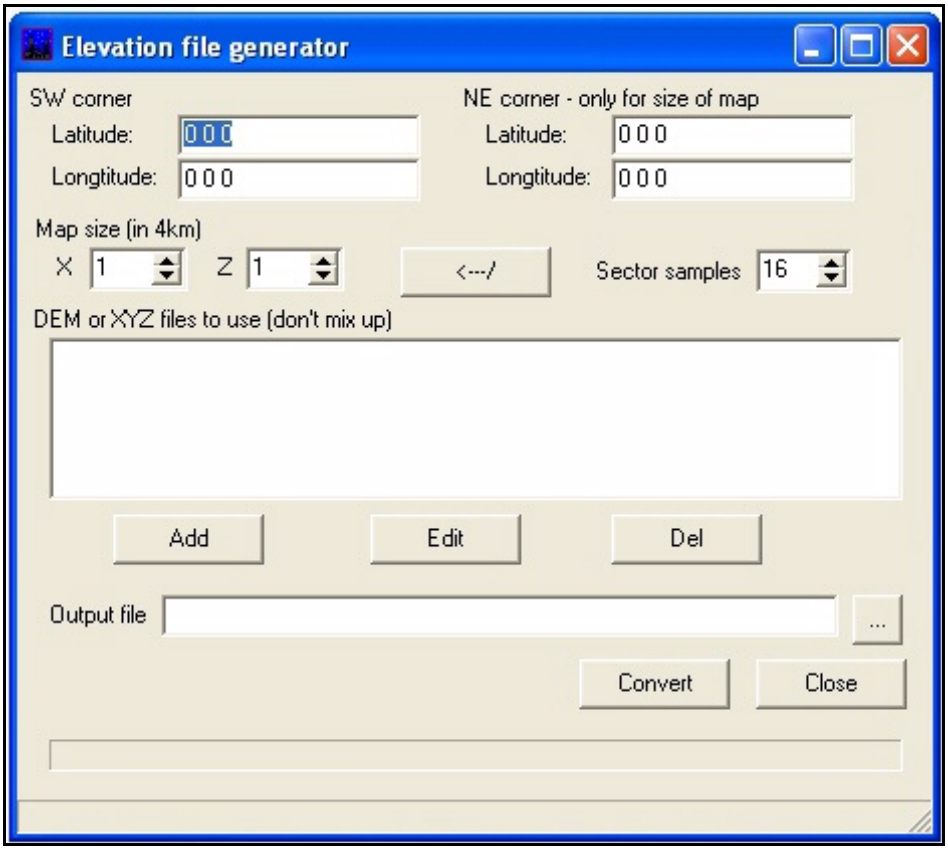
- Firstly create the folder that is going to store the Terrain Editor files and also a sub-folder called “Output”

- Now browse to and double click on the TerrainEd.exe

A) Generating an .ELEV file

- Click on the *Elevation* menu option and choose *Generate from DEMs or XYZs*

- The “Elevation file generator” (EFG) screen will now open up (as shown below)



- Into the SW corner and NE corner text boxes enter the coordinates that you saved earlier (You did take a note of them didn't you? ☺)

- These values need to be in a particular format:

    - If the first part of the coordinate number is below 10 then there is no zero before it
    - If it is a minus number it must include the minus sign
    - There must be 3 sets of number values for each coordinate

- So for instance the point on the map from the 3DEM program (shown to the right) would be entered into either of the corner text boxes like this:

    - Latitude: **52 10 06**
    - Longitude: **-2 15 57**

- The next thing to do is to increase the Sector Samples value to 32. This apparently makes a higher resolution map

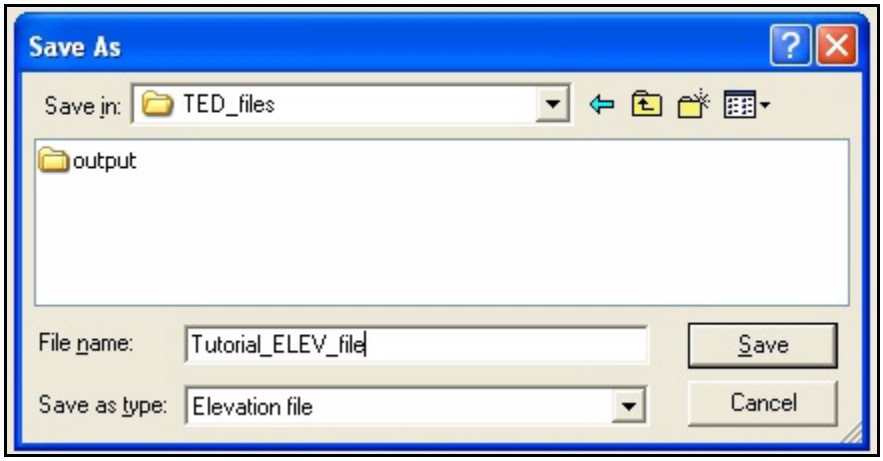
- Now click on the button to the right of the sector Sample value. This will transfer values into the Map Size X and Z values

- You now have to tell the EFG the location of the smaller DEM file that you saved earlier:

- Click on the **Add** button below the “DEM or XYZ file to use” window
- Browse to the smaller DEM file (that you exported out of 3DEM earlier)
- Select it and click on the **Open** button
- The path to the file will now appear in the list

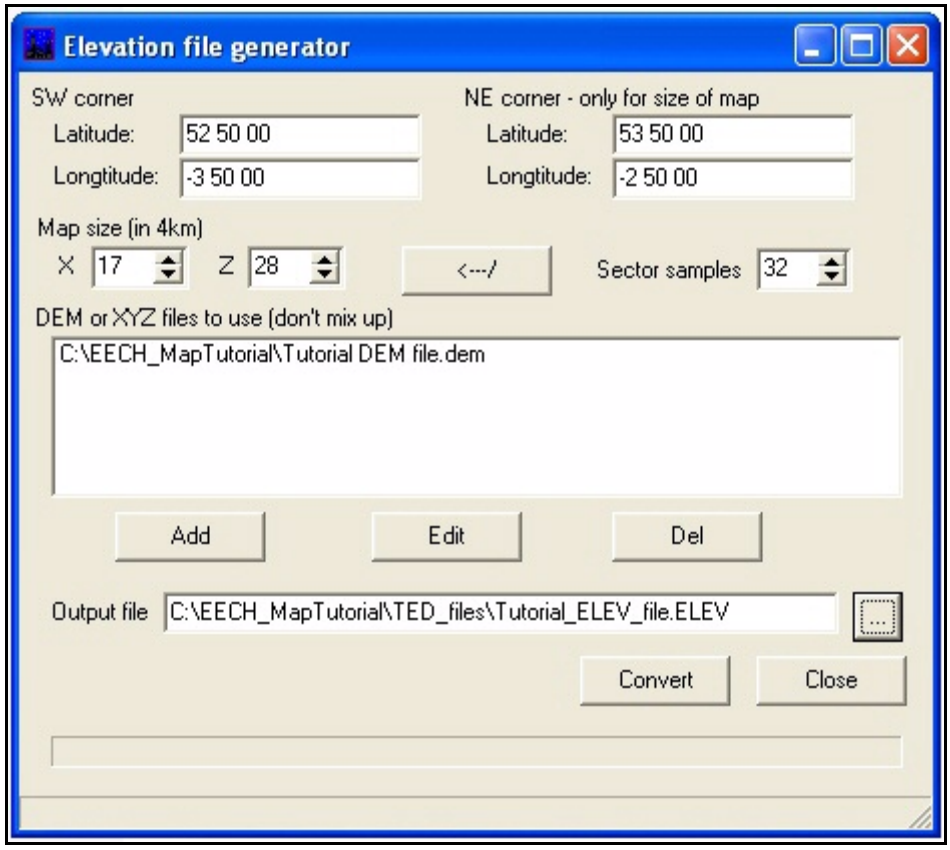
- Also set the output folder for the .ELEV file:

  - Click on the **…** button to the right of the Output file text box
  - Browse to where you created the folder to store the TED files (with the “output” sub-folder)
  - Type in a meaningful file name and click on the **Save** button



  - The output file name and location will now be shown in the Elevation file generator

- Shown below is an example of what the EFG screen should look like when all the information has been added in



- The last ting to do is click on the **Convert** button. The progress bar should now start indicating that the EFG is converting the file. When the process is complete a “Conversion successful” message box will be displayed

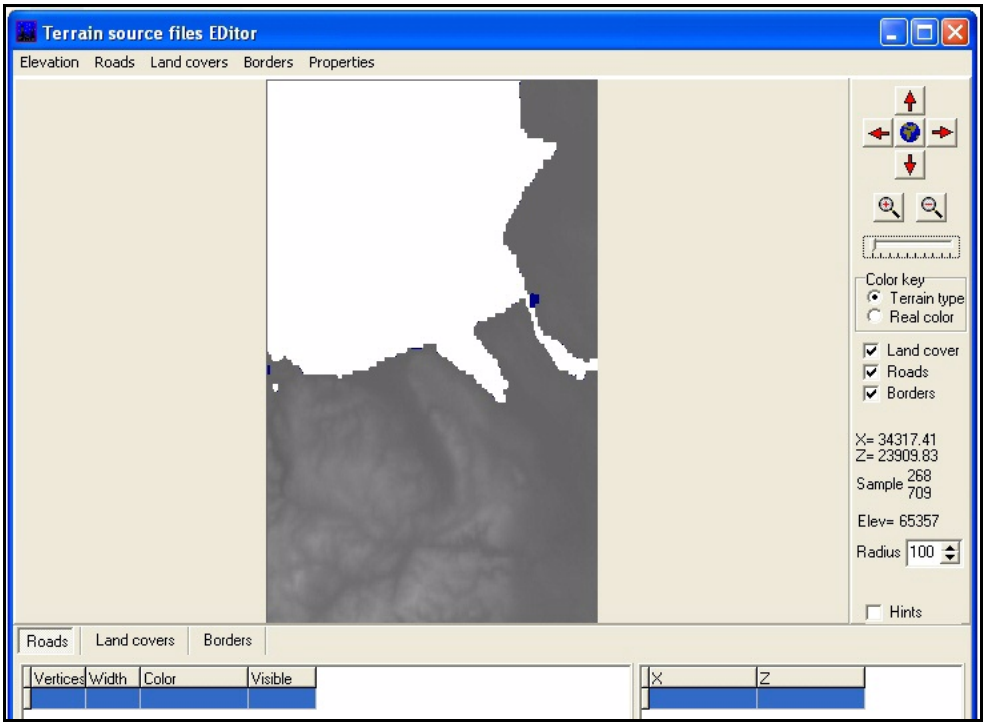
- Click on the **OK** button to dismiss the message box and then the **Close** button in the EFG window to close the EFG screen and move to the next stage

B) Adding roads, terrain features and borders

Now the .ELEV file has been generated it will need to be loaded into the Terrain Editor to be modified and additional features added:

- Click on the *Elevation* menu item and then choose *Load* from the drop down list. Now browse to find the .ELEV file you have just created and open it

- The Terrain Editor will now display the terrain



- If you have got water areas in the map sometimes they may not be properly imported
- In the map above the white areas are water but if you move your mouse over the area you will see that the Elevation is returning a number larger than zero (actual reading is 65357)
- A blue colour indicates that an area is water
-

05 Using the Terrain generator (TerrainGen.exe)