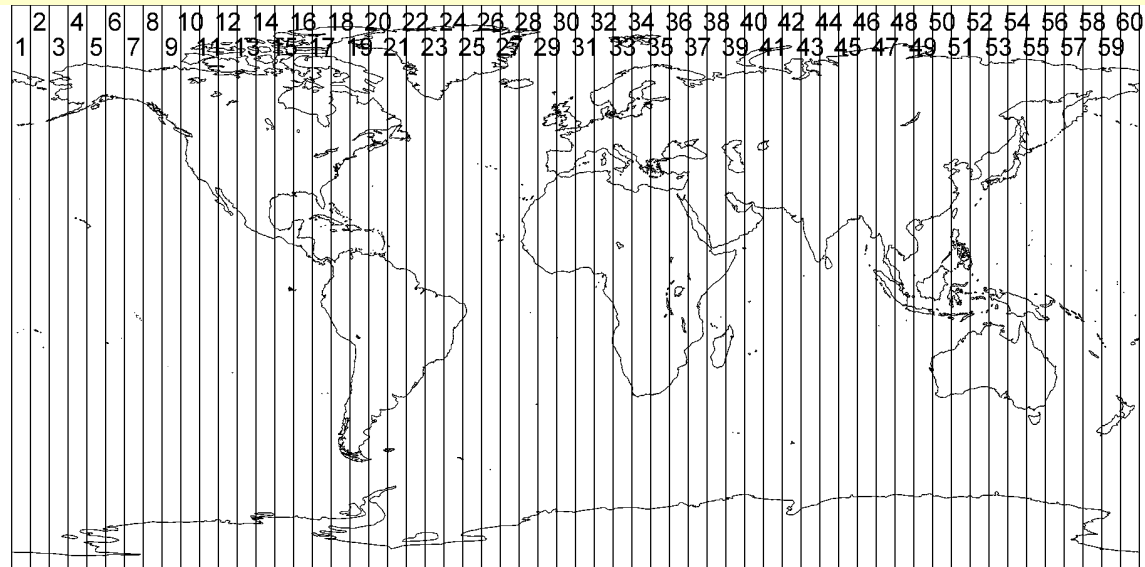


Satellite

The “Satellite” program downloads a tile of *Landsat* imagery from a NASA web site. The image is centred on a latitude and longitude location specified by the user and covers an area of 7.5 minutes of longitude by 7.5 minutes of latitude. After the image has been downloaded it is automatically processed to be projected to a suitable Universal Transverse Mercator (UTM) projection for the location. The image can then be saved either in its raw latitude and longitude state or in the UTM projection, or both. The images are automatically calibrated so that they can be used directly in mapping programs. Clearly the program requires that your computer has a reasonable internet connection.

About the Universal Transverse Mercator (UTM) projection

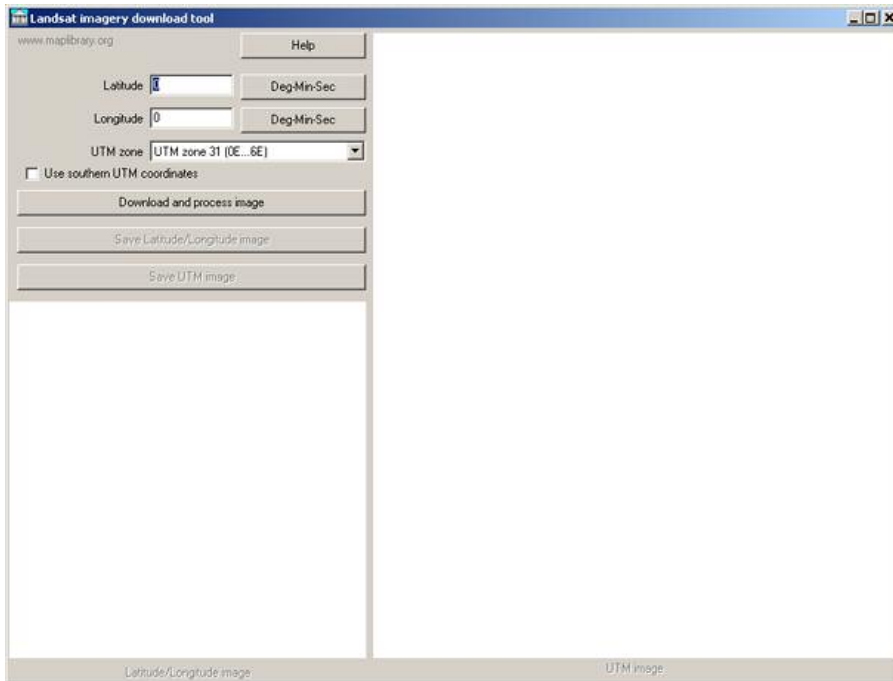
The UTM projection is, in reality, a family of 60 projections, each one optimised for a different region of the earth. Each UTM “zone” is designed for an area of 3 degrees each side of a specified line of longitude. For instance UTM zone 31 is designed for the slice of the earth centred on the 3 degrees East line of longitude. It stretches between longitude zero (the Greenwich meridian) and longitude 6 degrees east.



Locations at the centre of their UTM zone are shown in their true proportions. As you move further away, to the east or west from the centre, the distortions increase. Many countries are wider than six degrees of longitude wide, or do not fall neatly within one UTM zone. In these circumstances, the UTM zone nearest the centre of the country is usually used and it is just accepted that the representation of the easterly and westerly extremes of the country will be more distorted than we would wish. Large countries, such as India, Brazil, and Russia have to use several different UTM zones.

The Y ordinates of UTM coordinates are measured from the equator. For coordinates in the northern hemisphere the equator is deemed to have a Y ordinate of zero. However to avoid negative values, for coordinates in the southern hemisphere the Y ordinate of the equator is defined as 10,000,000 metres (10,000 Km). In cases where your area of interest spans the equator you may want to express coordinates in the northern hemisphere using the southern system – i.e. by adding 10,000,000 metres to the Y ordinate.

Start the program and in the two fields in the top left enter the latitude and longitude of the location that you are interested in.



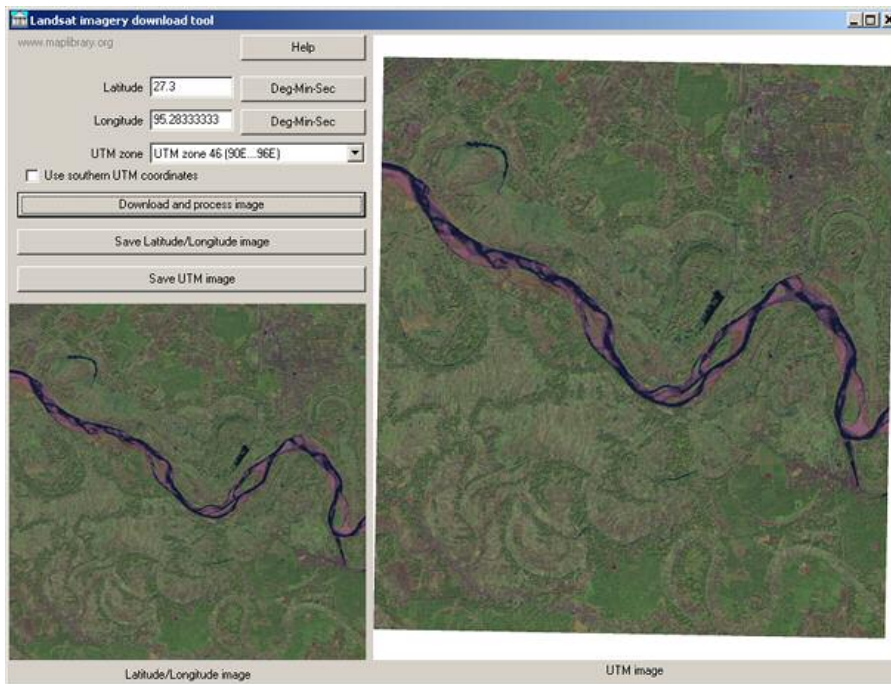
A latitude in the southern hemisphere should be entered as a negative number, i.e. 24 degrees South should be entered as -24. Similarly, western longitudes should be entered as negative values. If your coordinates are in degrees, minutes, and seconds you can click on the "Deg-Min-Sec" button next to either the latitude or longitude field and enter the values in the dialogue box that appears.

When you enter the longitude the program will automatically select the most appropriate UTM zone for that longitude. Alternatively, using the drop down box you can select one or two zones to either side of the automatically chosen zone. Similarly, if your latitude is in the southern hemisphere the program will choose the "Use Southern UTM coordinates" option. In some cases, where you are close to the equator, you might want to choose the southern UTM coordinates option even when in the northern hemisphere.

Once that you have set your latitude, longitude and UTM options, and if need be ensured that you are connected to the internet, then click on "Download and process image". The cursor will change to an hour glass. The time taken to download the image will depend on the speed of the internet connection. The download size of each tile is around 500kb – 600kb.

When the download is complete the latitude and longitude image that has been downloaded is displayed in the lower left of the screen. Automatically this is processed so shortly afterwards the UTM image appears on the right hand side.

The resolution of the latitude and longitude image is 1/16,384 of a degree per pixel – i.e. 0.2197 of an arc-second per pixel. The UTM image has a resolution of 7 metres per pixel.



After the images have been created you can click on “Save latitude/longitude image” or “Save UTM image”, or both, to save the images to raster files. The files are calibrated so that they can be used in mapping programs.