

Converting An AUSGeoid98 DAT File To A GPSeismic Geoid File

The following is a tutorial on how to convert an AUSGeoid98 DAT file to a GPSeismic geoid file:

According to <http://www.ga.gov.au/geodesy/ausgeoid/format.jsp> each DAT file has the following format:

Updated: 28 June 2005

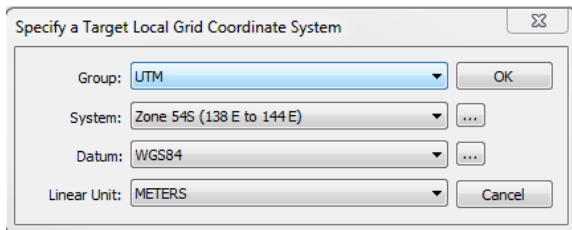
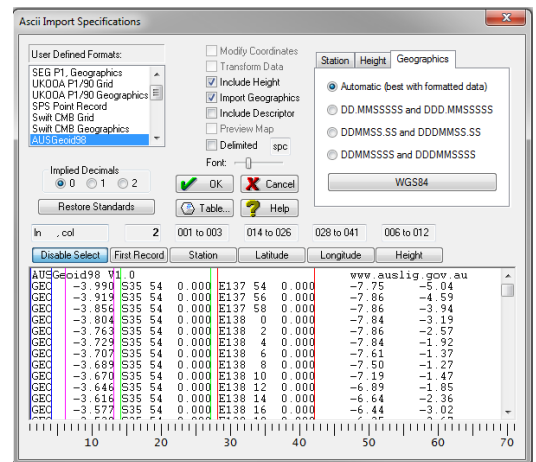
AUSGeoid Data Format

AUSGeoid98 data files have a header record at the start of each file, to distinguish them from the superseded AUSGeoid93 data files. AUSGeoid98 data files show the geoid-ellipsoid separation to 3 decimal places, while the superseded AUSGeoid93 data files showed only 2 decimal places. AUSGeoid98 deflections of the vertical were computed from the geoid-ellipsoid separation surface, while the AUSGeoid93 deflections of the vertical were computed from OSU91A.

(a)	(b)	(c)	(d)	(e)	(f)
GEO	51.293	S10 10 0.000	E129 0 0.000	2.39	-2.60
GEO	51.007	S10 0 0.000	E129 0 0.000	5.49	-3.06

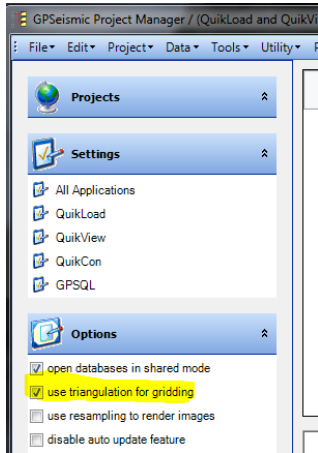
(a) Geoid record indicator
 (b) GRS80/WGS84 N Value (metres)
 (c) Latitude (GDA94/WGS84 - degrees, minutes & seconds)
 (d) Longitude (GDA94/WGS84 - degrees, minutes & seconds)
 (e) Deflection of the vertical in the meridian (sec) where the deflection is defined as 'astro' latitude minus 'geodetic' latitude (positive north, negative south)
 (f) Deflection of the vertical in the prime vertical (secs) where the deflection is defined as ('astro' longitude minus 'geodetic' longitude)*Cos(latitude) - (positive east, negative west)

We first need to import this data in QuikLoad as shown at right. Note that you can use the Table button to confirm your settings before leaving the dialog.

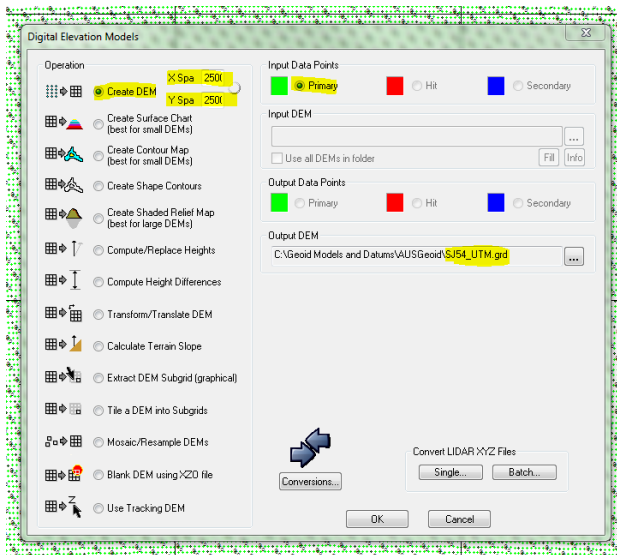


After the import, choose a UTM zone on WGS84 which best covers your area:

Proceed to create your QLD file. You are then done with QuikLoad.

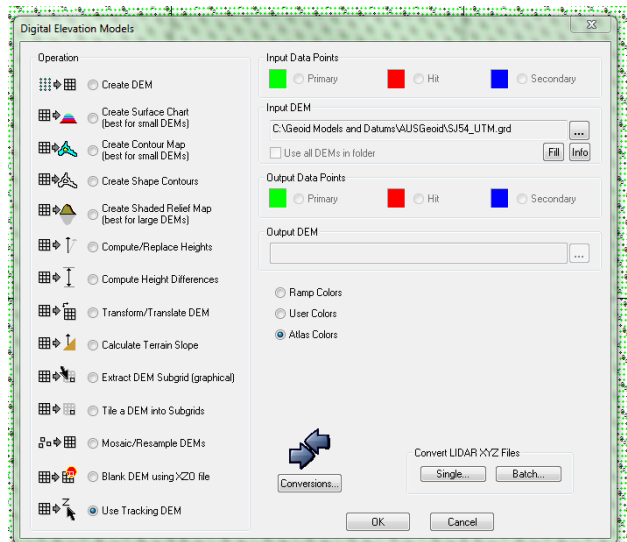


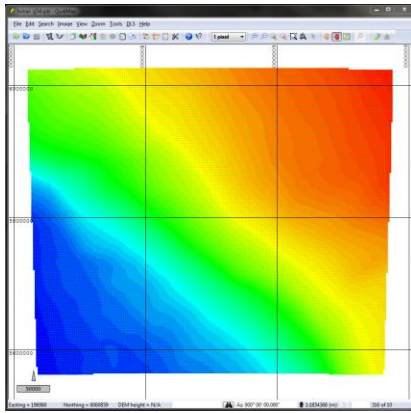
Start Project Manager and confirm that the selected gridding method is triangulation as this is the preferred method for use with geoid models.



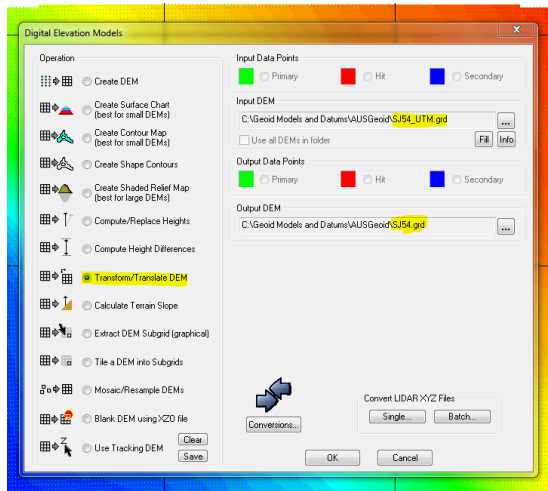
Start QuikMap, open your QLD file, and launch the DEM Operations dialog. Note that the point spacing's on the UTM grid vary but are approximately 3000 meters in easting and 3800 meters in northing. We want to create a DEM from this data and choose a spacing which is slightly less than the smallest spacing. 2500 meters would be fine.

Once the model in the UTM system is created, you can create a contour map of it via the use Tracking DEM option and selecting the GRD file you just made:

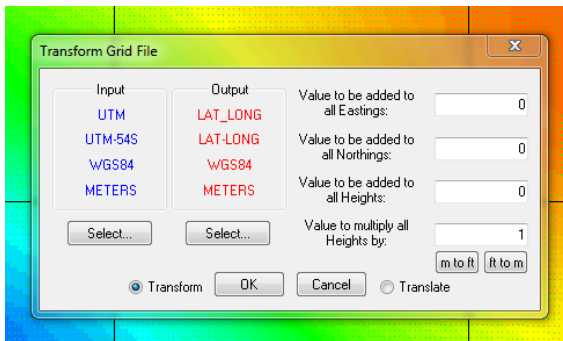




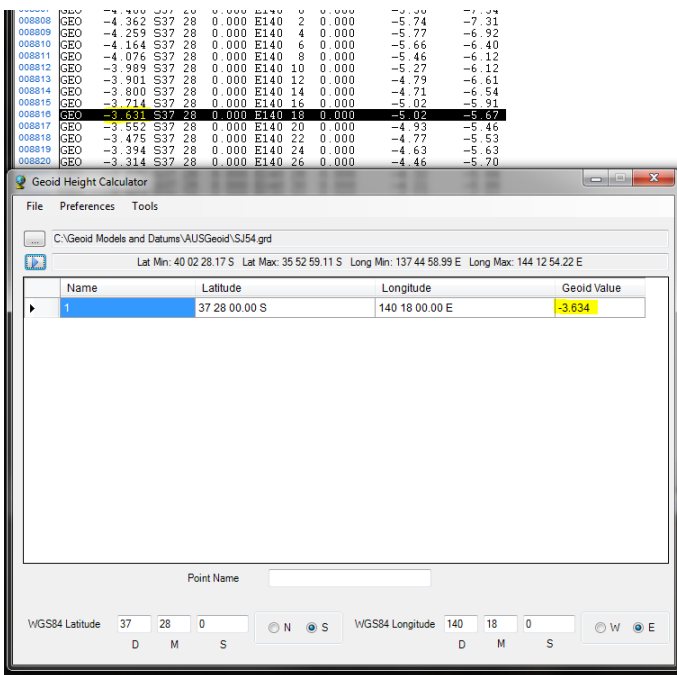
For the particular model used in this tutorial, we saw geoid heights ranging from about +7m in the northeast to -16m in the southwest:



The final step is to transform this model from UTM to geographic (lat/lon) for use as a geoid model. This can be done in the DEM Operations dialog via the Transform/Translate DEM option:



In the subsequent dialog, make sure to configure the Input side with the same systems as you used in QuikLoad (the same UTM zone) and the Output side as Lat-Lon in WGS84:



Finally, to test your model, you can use the GPS seismic Geoid height Calculator and compute heights for selected points from the original ASCII file:

The agreement should, in general, be sub centimeter depending on the localized rate of change of the model.

Note that you can combine multiple DAT files via the QuikMap File-Combine option before this process if you want your geoid model to cover a larger area.