

Title

3D Geophysical and Geological Map of the Georgina-Arunta region, NT
GEOCAT #75179

Theme

Gravity, magnetic, seismic data

Software

Created with Gocad 2009 (2.6.0)

File format

File format: Gocad Objects (points, polylines, surfaces, voxets)

Geographical Extent

Left: 130° 54'

Bottom: -27° 12'

Right: 136° 06'

Top: -20° 54'

Projected Map Extent – Metres

(easting, northing)

SW corner: 100000, 7000000

NE corner: 600000, 7670000

Depth

Upper limit: 2000 m

Lower limit: -60000 m

Projection

UTM MGA Zone 53 (central meridian of 135°)

Datum GDA94

Spheroid GRS 1980

Vertical datum: Australian height datum (AHD)

Input

Geoscience Australia digital elevation model - national dataset at 9 second resolution:

aus_dem_9sec_v3 (Geoscience Australia, 2011)

Other Geoscience Australia topographic data (Geoscience Australia, 2012).

Process**Cultural Data**

Cultural data were obtained from internal Geoscience Australia topographic data and are generally consistent with the TOPO250K data (Geoscience Australia, 2012). The following cultural data were obtained, projected in ArcGIS 10.0 and imported to Gocad:

- Roads:
Both principal roads and roads of 4 types: principal, secondary roads, minor roads and tracks;
- Localities:
Towns and named localities from the Australian Gazetteer; and
- Railways:
Railway locations and railway stations.

Topographic data

Cultural data were obtained from internal Geoscience Australia topographic data and is generally consistent with the TOPO250K data (Geoscience Australia, 2012). The following topographic data were obtained, projected in ArcGIS 10.0 and imported to Gocad:

- Rivers;
- Lakes; and
- Topographic relief
(discussed below in the Digital Elevation Model section).

Digital Elevation Model (DEM)

Dataset clipped from *aus_dem_9sec_v3* (Geoscience Australia, 2011) and re-projected to UTM MGA zone 53.

Exported in ASCII format and then imported into Gocad as a pointset.

A simple surface was created and constrained by the points.

Finally, a Gocad script was used to optimise the size and distribution of triangular facets. This enabled the topography to be accurately represented, while minimising the filesize of the surface.

Earthquakes

Earthquakes were extracted from the Geoscience Australia database (as of 30 June 2012) of earthquakes, QUAKES. These were then projected to MGA zone 53 and imported to Gocad as a pointset.

Mineral deposits, mines and occurrences

Mineral deposits, mines (including historic) and occurrences were extracted from the Geoscience Australia database (as of 30 June 2012) of mineral deposits, OZMIN. These were then projected to MGA zone 53 and imported to Gocad as pointsets.

Project Boundaries

Project boundary surfaces, for both the full extent of the 3D map volume of interest and for the cover and basement geology voxel (+2 km to -10 km in elevation range) are included in this 3D map release. These were created from curves representing the top and bottom areas of interest and created using Gocad.

Output

(all under \Additional_Data folder)

Cultural data

\Cultural_Data\All_Roads.gp: Group of curves representing all 4 classes of roads.

\Cultural_Data\Principal_Roads.pl: Curves representing principal roads.

\Cultural_Data\Localities_Named_Places.vs: Points representing major places, as per 'named places' features in the *Gazetteer of Australia*, 2010 (Geoscience Australia, 2010).

\Cultural_Data\Localities_Towns.vs: Points representing towns.

\Cultural_Data\Rail_Lines.pl: Curves representing rail lines.

\Cultural_Data\Railway_Stations.vs: Points representing railway stations.

Topographic data

\Other_Topographic_Data\Lakes_as_surfaces.ts: Lakes represented as surfaces.

\Other_Topographic_Data\Lakes_Outlines.pl: Outlines of lakes.

\Other_Topographic_Data\Rivers.pl: Curves representing rivers.

Digital Elevation Model

\Digital_Elevation_Model\DEM.ts: Optimised surface representing the digital elevation model for the 3D map.

Data are sourced from GEODATA 9 second digital elevation model (Geoscience Australia, 2011).

Earthquakes

\Earthquakes\Earthquakes.vs: Points representing earthquakes extracted from the Geoscience Australia database of Australian Earthquakes. Data are current as of 01 June 2012.

Mineral deposits, mines and occurrences

\Mineral_Deposits\Mineral_Deposits.vs: Points representing mineral deposits.

\Mineral_Deposits\Mineral_Occurrences.vs: Points representing mineral occurrences.

\Mineral_Deposits\Mines.vs: Points representing mines, both operating and historic.

All data are extracted from the OZMIN database at Geoscience Australia and are current as of 01 June 2012.

Project boundaries

\Project_Boundaries\3D_Map_Full_Boundary.ts: Vertically-sided surface representing the full 3D map volume of interest.

\Project_Boundaries\Project_Boundary_Basins_and_Basement.ts: Vertically-sided surface representing the volume of interest for the 'cover and basement geology' voxel (+2 km to -10 km elevation).

References

Geoscience Australia, 2010. Gazetteer of Australia 2010 Release.

https://www.ga.gov.au/products/servlet/controller?event=GEOCAT_DETAILS&catno=71110, electronic data, Geoscience Australia, Canberra.

Geoscience Australia, 2011. *GEODATA 9 Second Digital Elevation Model (DEM-9S) Version 3*. <http://www.ga.gov.au/meta/ANZCW0703011541.html>. Geoscience Australia, Canberra.

Geoscience Australia, 2012. GEODATA TOPO 250K Series 3. <http://www.ga.gov.au/meta/ANZCW0703008969.html>. Geoscience Australia, Canberra.

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