Southern Thomson Orogen
Geological Survey of New South Wales
Update: March 2015

Geophysical surveys
A program of regional geophysical data acquisition was completed in 2014 as part of a collaborative project by the Geological Survey of New South Wales, Geoscience Australia and the Geological Survey of Queensland.

A helicopter-borne electromagnetic survey in May 2014 investigated the near-surface geology and hydrogeology on the Eulo Ridge in the Hungerford area and along regional transects. Results will be used to interpret the bedrock surface and conductivity layers, assess the undercover geology and prospectivity, and support land and water resource management.

The Southern Thomson Orogen VTEMplus® Airborne Electromagnetic Survey comprised:

- a regular regional survey on 5 km spaced east–west lines, (3352 km total) covering 16 261 km², including the area between Hungerford and Wanaaring in NSW
- two regional north–south traverses adjacent to roads (915 km total), including lines through Barringun–Brewarrina–Gongolgon, and Hungerford–Wanaaring–Tilpa in NSW.

Figure 1: a) GeoTech Airborne Ltd: VTEMplus® survey in progress. b) pseudosection of conductivity depth c) perspective view of conductivity pseudosections
Survey data were processed by Geotech Airborne Ltd using its FullWaveForm® processing techniques. The data comprise the final contractor-supplied (Phase 1) datasets from the AEM survey, including located data and conductivity depth sections. Electromagnetic inversion results were generated using two different types of algorithm – a deterministic regularised gradient-based algorithm and a reversible-jump Markov chain Monte Carlo algorithm – that both assume a layered earth or 1D conductivity structure. Each airborne electromagnetic sounding is inverted independently and the results are then stitched into combined sections.

AEM data and inversion results can be downloaded through the Geoscience Australia website free of charge.

Other geophysical surveys were acquired along two regional transect lines – gravity at 300 m station spacing and magnetotellurics (MT) at 5 km spacing. They will provide information on density and conductivity variations which will help construct a 3D framework for cover and basement rocks. Survey data are currently being processed and results will be released in 2015.

More information
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