

How to access New South Wales geophysical data

Astrid Carlton*

*Geological Survey of New South Wales
Division of Resources & Geoscience
NSW Department of Planning & Environment
516 High St, Maitland
astrid.carlton@planning.nsw.gov.au*

SUMMARY

This article provides instruction on how to access large repositories of geophysical data held by the New South Wales Government. This data was acquired by government and private companies. Various products have been produced from this data and made available to the public; most are free. Each product was produced for different purposes and is delivered through different systems, which are not broadly utilised by the geophysical community. The following products are available to the public.

(1) Regional project data comprises airborne magnetic, radioelement, digital elevation, gravity, hyperspectral, electromagnetic (EM) and ground gravity data acquired using government funding. This data is available on portable hard drive and some is available through the Geoscience Australia GADDS portal. This data is ideal for producing potential field models, or custom imagery.

(2) Statewide grids, images and maps are merged regional airborne magnetic, radioelement, digital elevation and ground gravity data. These are available respectively through portable hard drive, MinView and DIGS. This data is suited to large-scale geological interpretations, or producing custom clipped imagery.

(3) The 250K geophysical imagery suite includes zip files of prepared standard imagery clipped from our statewide grids that enhance subtle features not readily visible in the statewide images. The 250K suite can be downloaded through DIGS.

(4) The open-file company data repository contains approximately 1000 surveys (of various geophysical techniques) submitted by title holders. The survey location can be viewed in MinView and requested by email. This data usually has higher resolution than NSW Government regional project data. It is excellent for producing models, small-scale geological interpretation and desktop studies.

Key words: Free, geophysics, NSW, New South Wales.

INTRODUCTION

The Geological Survey of New South Wales is custodian of a large repository of geophysical data. Much of this data is available to the public as different products, for free. NSW Government policy is to provide precompetitive data to promote economic development and make information open file. The geophysical data was collected to aid geological interpretation, especially in areas under cover. This guide will help you access NSW geophysical data from various webpages and applications.

The following are explained herein:

- Download of geophysical survey data (grids, line and point data) for free through the Geoscience Australia GADDS portal.
- Access to statewide images (and clips from the statewide images) through MinView.
- Downloading clipped 250K map sheet images (that enhance subtle features) from DIGS.
- Viewing location and metadata of high resolution company data using MinView. Download of the data is dependent on its confidentiality status.
- Purchase of all NSW government-acquired geophysics on portable hard drive.

METHOD AND RESULTS

Regional project data

The NSW Government has been acquiring airborne magnetic, radioelement and Digital Elevation Model (DEM) data since 1991, under various NSW Government funding initiatives and in collaboration with Geoscience Australia. About 85% of NSW has been surveyed at 400 m line spacing or closer. The NSW Government has also acquired ground gravity readings across NSW, with about 73% of the state covered with 4x4 km or closer readings. Download these surveys through Geoscience Australia's Geophysical Archive Data Delivery System (GADDS).

Accessing regional project data through GADDS

GADDS can be used to access geophysical point, line and grid data for airborne magnetic, radioelement, DEM and ground gravity surveys. These data can be used to produce detailed potential field models, grids and imagery. To access GADDS visit:

http://www.geoscience.gov.au/cgi-bin/mapserv?map=/nas/web/ops/prod/apps/mapserver/gadds/wms_map/gadds.map&mode=browse

There are helpful hints on the GADDS webpage and there is an excellent guide on how to use GADDS at:

https://www.ga.gov.au/gadds/gadds_help.jsp

Portable hard drive

Hyperspectral, airborne EM and airborne gravity data are not available through GADDS. They are available on a portable hard drive from the Geological Survey of New South Wales (see section below 'Purchase regional projects, state wide grids and images').

Accessing statewide geophysical images

There are seven statewide geophysical images that can be viewed, clipped or downloaded using MinView. You can also view the images using GSNSW's mobile app. Maps of state wide images can be downloaded or purchased through DIGS. The following statewide geophysical images are accessible through each of these platforms:

- Total Magnetic Intensity Reduced-to-Pole (TMI RTP)
- 1st Vertical Derivative (1VD) TMI RTP
- TMI RTP over tilt-filtered TMI RTP
- Ternary KThU radioelements
- Isostatic Bouguer gravity
- Isostatic Bouguer gravity over tilt-filtered TMI RTP
- Digital Elevation Model

Mobile app

If you are travelling or doing field work you can use GSNSW's mobile phone maps to view geophysical imagery. The images are stored on your phone and no mobile reception is required to view images. To access this application visit:

<https://www.geoscience.nsw.gov.au/phonemaps/>

Once you have installed the correct app for your mobile operating system click on the 'Map List' tab. There are many maps/images listed in a table. Scroll down to a row with a geophysical image you want. In the same row tap on the mobile system version you require. You can then save the file to your mobile.

MinView

MinView is an online application for PCs and tablets. It allows users to view statewide geophysical imagery, clip and download it. There are seven high resolution statewide geophysical images available for download through MinView. The imagery can be downloaded as georeferenced jpegs, ecws or tiffs. These images are large, being approximately 2 GB in size each, so don't try to download all of them at once as the system will not respond well. Clipping the area to your Area of Interest (AOI) will provide a more manageable file size.

These images are good to use in reports and for preliminary geological interpretation but are only appropriate at regional scale as the colour stretch is applied over the entire state. For better definition of subtle anomalies GSNSW recommends using local-area colour stretched images in the 250K geophysical imagery suite available through DIGS.

Use a web browser to navigate to:

<https://minview.geoscience.nsw.gov.au/>

In the web browser there is aerial photo imagery. On the left hand side is a table of contents where map layers and images can be added to view. Click on 'Add layer'. Scroll down and click on 'Geophysical Layers'. Click on the title of the type of geophysical image you want. Then click 'Add'. The image title will be transferred to the 'Map Layers' column on the left and displayed in the map view. You can view metadata about the image by clicking on 'Info'.

Once the image you want is displayed you can download the statewide image or a clipped area. To clip an area from the statewide image, zoom in until the area you want covers the map view, then click on 'More' then 'Download'.

DIGS

There are seven statewide geophysical maps available for download (as a JPEG or ECW) through DIGS. Hard copies can also be purchased at A0 size for \$19.80. These are excellent for large scale regional geological interpretations. To access visit:

[https://search.geoscience.nsw.gov.au/?q=statewide%20geophysics%20maps&sort=score%20desc&t=gpc&a=true&p=false&f=%5B%7B%22field%22:%22productScale%22,%22query%22:%22\(%5C%221:1,500,000%5C%22\)%22%7D%5D&s=true&page=1&count=50](https://search.geoscience.nsw.gov.au/?q=statewide%20geophysics%20maps&sort=score%20desc&t=gpc&a=true&p=false&f=%5B%7B%22field%22:%22productScale%22,%22query%22:%22(%5C%221:1,500,000%5C%22)%22%7D%5D&s=true&page=1&count=50)

If the above link does not work it may be due to previous spatial extents set in your last visit to the DIGS website. Use the 'Click here to set your area' function to reset to entire state. Then retry above link.

Accessing 250K geophysical imagery suite

Suites of geophysical imagery have been generated for each 1:250 000 map sheet area in NSW. These images are excellent for geological interpretation and reports. The images were generated with colour stretches optimised to enhance subtle features not readily visible in statewide imagery. Twenty types of geophysical imagery have been generated in three image formats (ECW, JPEG and ECW), using two coordinate systems MGA and GDA (latitude, longitude). Download these image suites for free through [DIGS](https://search.geoscience.nsw.gov.au/?q=geophysical%20imagery&sort=score%20desc&t=gpc&a=true&p=false&s=false): <https://search.geoscience.nsw.gov.au/?q=geophysical%20imagery&sort=score%20desc&t=gpc&a=true&p=false&s=false>

Geophysical imagery for each map sheet comprises:

- **Aeromagnetic data:** TMI, TMI RTP, 1VD TMI, 1VD TMI RTP, 2VD TMI, greyscale TMI, greyscale TMI RTP tilt-filter and TMI RTP over TMI RTP tilt-filter,
- **Gravity data:** Bouguer gravity, isostatic Bouguer gravity, greyscale isostatic Bouguer gravity tilt-filter, isostatic Bouguer gravity over TMI RTP tilt-filter, and isostatic Bouguer gravity over isostatic Bouguer gravity tilt-filter,
- **Radiometric data:** Ternary K/U/Th, potassium (%) band-pass filtered over SRTM DEM, thorium (ppm) band-pass filtered over SRTM DEM and uranium (ppm) band-pass filtered over SRTM DEM,
- **Additional:** DEM, Landsat-7 principle components 1, 2 & 3.

Metadata about imagery colour schemes, units and preparation are in an XML file included in the download.

Accessing company data

Companies with exploration or mining titles in NSW must submit geophysical data acquired over their tenement to the NSW Government as part of exploration reporting requirements. The data usually has higher resolution than regional government surveys. Approximately 1000 geophysical surveys are indexed in a GSNSW database, which contains their location and metadata. There are many types of airborne and ground geophysical surveys in this repository: gravity, magnetic, radiometric, digital elevation, induced polarisation (IP), resistivity, EM, time-domain EM, frequency-domain EM, magnetotelluric (MT), hyperspectral and other surveys (see Figure 1). Accessing open-file company geophysical data can be useful for desktop studies (especially in the initial stages of exploration), geological interpretation and generating detailed models.

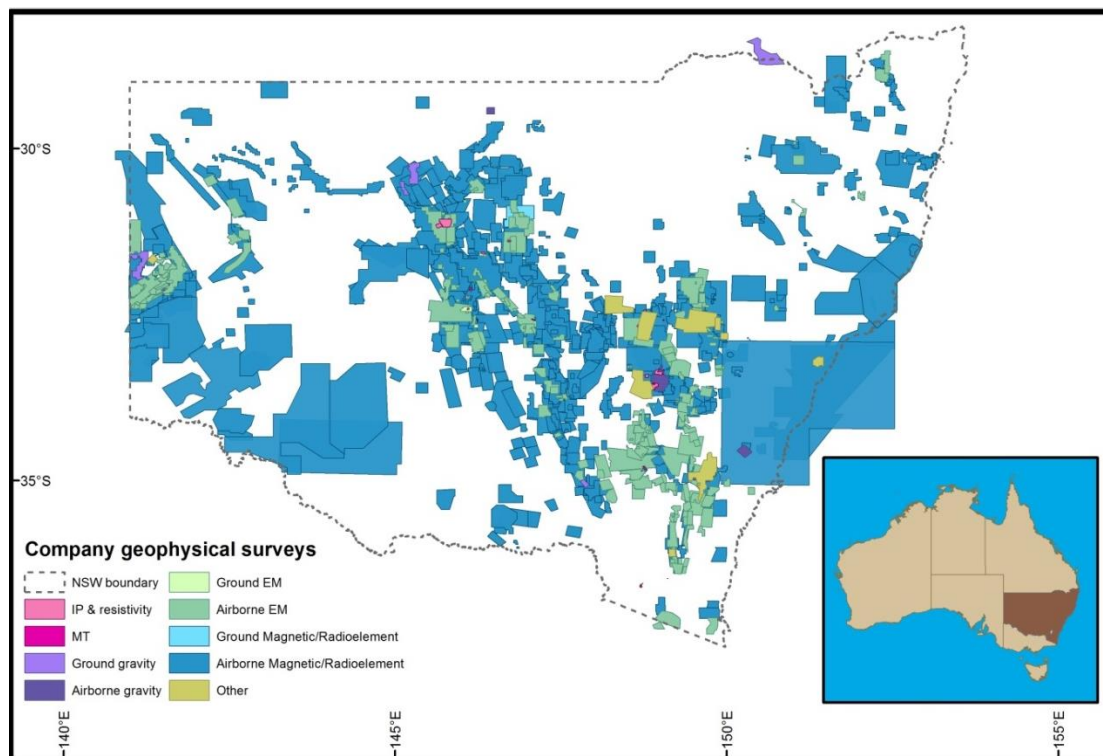


Figure 1: Map of open file and confidential geophysical surveys submitted to the NSW Government by companies holding mining and exploration titles.

To obtain company geophysical data use MinView to ascertain if there are company geophysical surveys in your area of interest. Request data by email. GSNSW staff will check the confidentiality status of the survey and, if open file, provide the data via Google Drive, FTP transfer or digital media.

Use a web browser to navigate to:

<https://minview.geoscience.nsw.gov.au/>

In MinView, click on 'Add Layer' then click on 'Company geophysics' and 'Add'. Zoom to your area of interest and use the 'Spatial search' tool to ascertain details of the surveys. Email the survey number and name to geophysics.products@planning.nsw.gov.au

.Purchase regional projects, statewide grids and images

NSW Government Geophysics Data Package, Version 1, is available now on a single portable hard drive costing \$110 ([Ordering information](#)). This data package contains multiple surveys acquired by the NSW Government and Geoscience Australia under various funding initiatives. Included is data from:

- 41 airborne magnetic, radioelement and elevation surveys,
- 29 ground gravity surveys,
- one airborne gravity survey,
- three airborne EM surveys,
- three airborne hyperspectral surveys, and
- multiple statewide grids and images (including projections not available through online applications).

Located data for each project area are provided in five different formats (ascii text, BIL files, ASEG GDF and ASEG GDF2). Grids of each project area and the statewide merges are provided as ER Mapper grids (ERDAS®), and images are provided in ECW, TIFF, or JPEG formats. Where available, supporting documents like acquisition reports, metadata and ESRI® shapefiles are included. Older surveys are less likely to have supporting documentation.

This data package is an excellent way to obtain GSNSW data as:

- Not all of GSNSW regional projects are available to download through GADDS
- Downloading the data from GADDS can be time consuming

For details on the geophysical surveys, grids and images included on the hard drive visit:

<http://www.resourcesandenergy.nsw.gov.au/miners-and-explorers/geoscience-information/products-and-data/geophysical-images-and-data>

Payment is made using the Geoscience order form:

http://www.resourcesandenergy.nsw.gov.au/data/assets/pdf_file/0009/94419/Geoscience-Product-Order-Form.pdf

CONCLUSIONS

The Geological Survey of New South Wales has made a large repository of available to the public for free. Regional project data is available through GADDS, or can be purchased on portable hard drive for \$110. Statewide grids are included in the hard drive. Images of the grids can be downloaded through MinView. Clips from the statewide coverage can also be downloaded through MinView. Posters of statewide geophysics can be downloaded from DIGS. The 250K geophysical imagery suite is available DIGS. The spatial location of company data can be viewed in MinView and requested by emailing geophysics.products@industry.nsw.gov.au. If the data is open-file it will be made available through file transfer applications.

ACKNOWLEDGMENTS

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REFERENCES

DIGS

<https://search.geoscience.nsw.gov.au/>

GADDS

http://www.geoscience.gov.au/cgi-bin/mapserv?map=/nas/web/ops/prod/apps/mapserver/gadds/wms_map/gadds.map&mode=browse

MinView

<https://minview.geoscience.nsw.gov.au>

NSW geophysical images and data

<http://www.resourcesandenergy.nsw.gov.au/miners-and-explorers/geoscience-information/products-and-data/geophysical-images-and-data>

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