



ISSUE 27, MARCH 2016

Early date for Exploration in the House

3rd May, 1pm–6pm, Parliament House Theatre, Sydney

EITH2016 will be held on 3rd May at its usual location in the Parliament House Theatre, Sydney. The program will highlight Geological Survey of New South Wales (GSNSW) projects. The event will be opened by the Hon. Anthony Roberts, Minister for Industry, Resources and Energy. Guest speaker is Assoc. Professor Cam McCuaig, Director for the Centre for Exploration Targeting at University of Western Australia and his topic is Exploration Targeting Under Cover.

Presentations will cover results from a 3D spectral study of a Cu–Au porphyry system; a round-up of the first Cooperative Drilling Program results; stratigraphic drilling in the Thomson Orogen; seamless geology of western NSW; geoscience information data delivery and; the new Cobar metallogenic map.

[Program and registration available online](#)

NSW Exploration Data Workshop, EITH2016 morning session

3rd May, 8:30am–12pm, State Library, Macquarie Street, Sydney

This year **EITH2016** includes a morning workshop. Bring your own laptop for a hands-on half-day workshop investigating the Geological Survey's new 3D data models, databases and online information systems.

[Workshop program and registration available online](#)

Contact: geosurvey.events@industry.nsw.gov.au, 02 4931 6592

NSW Minerals Council Exploration Forum

4th May, Parliament House Theatre, Sydney

This forum is the leading exploration event focusing on regulatory compliance, community engagement and environmental management. It will include presentations on leading industry practices and government policy updates to ensure delegates are up to date on all the issues 'beyond the rocks'.

[Program and registration available online](#)

New — NSW 3D geology web-based viewer

The GSNSW collection of 3D datasets can now be viewed online using the GSNSW 3D geological model viewer. The layer menu allows users to choose models or objects within a model that they want to look at in detail. Objects in the viewer can be rotated on the screen and sliced to provide a cross-section. The 3D geological models allow you to examine spatial and geometric relationships that are important for understanding and predicting the distribution of resources.

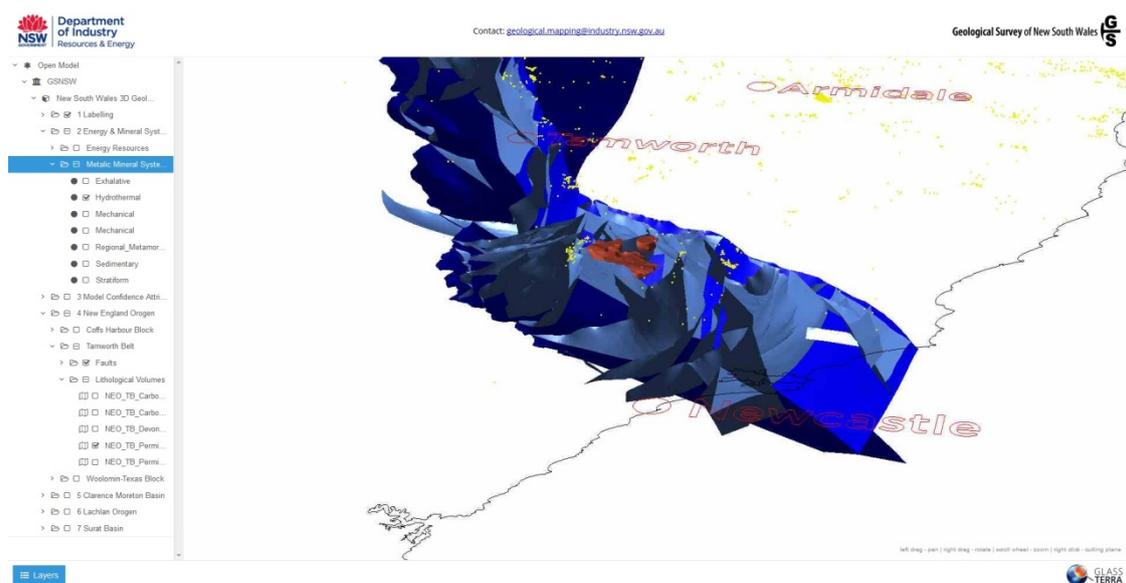
The viewer is powered by Glass Terra and will in the near future allow users to import and view their own spatial data and examine relationships in the regional geological framework provided by GSNSW data.

[Watch the instructional video for using the viewer](#) then [take the viewer for a spin](#) (literally)

[Read about some of the projects](#)

[Download available data](#)

Contact: Jamie Robinson, jamie.robinson@industry.nsw.gov.au, 02 4931 6730



View of hydrothermal metallic mineral systems overlain on the 3D model of the Tamworth Belt, southern New England Orogen

3D model of the Darling Basin commences

A 3D model of the Darling Basin, beginning with the Bancannia Trough, is being developed to better define the geometry and stratigraphy of this under-explored area in western NSW. The Bancannia Trough model is based on 800 km of 2D seismic surveys and is supported by stratigraphic relationships which generate a realistic depositional environment. Interpreted basement has been modelled to a maximum two way time (tw) of 3800ms (approximately 6600 m) and is bounded by high angled fault zones in the east and west.

Modelling has shown:

- The trough is asymmetric, deepest in the south and east, shallowing towards the north and west. The modelled basin extends 211 km north–south and has a maximum width of 41 km
- The current geometry of the trough displays an oblique strike-slip component with sinistral sense of movement. Intra-basin faults show both compressional and extensional components
- Early basin fill in the south is thicker but less laterally extensive than younger units
- The basement becomes less defined in the southern region and increasingly structurally complex, with highs and complex fault development
- The central portion of the trough is the least structurally complex, however the northern third has more structural complexity indicated by discontinuous and chaotic seismic responses

Contact: Stephen Dick, stephen.dick@industry.nsw.gov.au, 02 4931 6721

3D model of the Hunter Coalfield for hydrogeology

A 3D model of the Hunter Coalfield is being developed to form the basis for a refined structural model of the Hunter Coalfield for use in hydrogeological modelling and groundwater studies.

Contact: Stephen Dick, stephen.dick@industry.nsw.gov.au, 02 4931 6721

NSW statewide geophysical data 2014

Statewide geophysical images and grids are available as a 2 box set of 4 DVDs. It includes ER Viewer software for Windows. The images can be viewed in Google Earth from the [Geoscientific Data Warehouse](#).

[Go to the ER Mapper grids and image types](#)

Contact: geophysics.products@industry.nsw.gov.au

XplorPak2016 — NSW Explorers Directory

The [XplorPak2016](#) NSW has replaced the NSW Explorers Directory with an upgraded user-friendly interface. It provides information, links and data on mineral, geothermal, coal and petroleum exploration and production in NSW to help prospective explorers and other stakeholders.

XplorPak2016 allows a search by commodity for active NSW exploration companies and the current titles they hold. It has information on current hot prospects, prospective ground and active mines and developments. It contains data for geology, mineral occurrences, geophysics, petroleum and exploration or mining titles — as Google Earth KMZ files, ESRI shapefiles, MapInfo tables and in ArcReader PMF format. There is an overview of current GSNSW projects, links to our products and online services, current information on the NSW exploration industry and a summary of the geology of NSW.

Contact: geoscience.products@industry.nsw.gov.au for your free DVD

Advanced Mineral Projects & Exploration Highlights in NSW map, January 2016

Recent exploration results, in the form of drilling intercepts and resource figures, are presented along with resource figures for operating mines on the [Advanced Mineral Projects & Exploration Highlights in NSW map](#). The information is sourced from selected exploration results and resource calculations published in company reports available to the public.

Contact: geoscience.products@industry.nsw.gov.au or [download a copy of the map](#)

NSW stream sediment geochemistry (2004) now in the GDW

The 2004 NSW stream sediment geochemistry dataset is no longer available as a CD but is accessible through the [Geoscientific Data Warehouse](#) (GDW). It comprises 866 open file DIGS reports from 1967–1999 containing about 281 000 surface samples and 58 000 drill collars with associated analytical results. The new GIS-friendly assay outputs in the GDW ([see On The Outcrop 26](#)) ensure easy data visualisation.

Contact: Catherine Shirley, catherine.shirley@industry.nsw.gov.au, 02 4931 6582

New — Bedrock Exposure map in NSW seamless geology

A Bedrock Exposure map now complements seamless geology coverage for UTM Zone 56. The map combines aspects of soil data (Office of Environment and Heritage); depth of regolith (CSIRO) and; GSNSW field observations and structural data points.

Existing geology maps generally only give a rough indication of outcrop extent, commonly overestimating the area of exposed bedrock. The new Bedrock Exposure map provides a reliable spatial approximation of exposed bedrock which will aid field work and sampling.

The data has been added to the Seamless Geology Data Package for Zone 56 and is available as a phone map.

Go to [GS report GS2016/0267](#) (in DIGS) outlining the methodology

Go to [Seamless Geology data package](#)

Go to [GSNSW Phone Maps map list](#)

Contact: Kyle Hughes, kyle.hughes@industry.nsw.gov.au, 02 4931 6582

East Riverina Mapping Project update

A [quarterly project update](#) and new field observations (available through the [Geoscientific Data Warehouse](#)) were released mid January. New findings on the Gurragong Volcanics highlight the extent of silicic ignimbrite eruptions through the area in the Early Devonian ([GS Report GS2015/1290 in DIGS](#)). The 2016 mapping season commences in April.

Contact: Phil Gilmore, phil.gilmore@industry.nsw.gov.au, 02 4931 6533

Southern Thomson Orogen Project update

[Southern Thomson Mineral Allocation Areas](#) have been established for [Group 1 \(metallic\) minerals](#) to accommodate the proposed stratigraphic drilling [for this collaborative project](#) with Geoscience Australia and the Geological Survey of Queensland. The project aims to define basement geology in the Eulo–Wanaaring–Hungerford–Bourke region of northern NSW and southern Queensland. Key geological sites for drillcore samples were identified using geological and geophysical investigations completed for the project in 2015.

Contact: Rosemary Hegarty, rosemary.hegarty@industry.nsw.gov.au, 02 4931 6597

Mineral systems models

The MinSys team has finalised the Mineral System Models template and has almost completed the volcanic associated massive sulfide (VAMS) mineral system model for NSW.

MinSys studies on the Drake epithermal gold–silver field were boosted by four preliminary SHRIMP age dates on rocks spatially or genetically associated with a range of mineral deposits at Yerranderie, Shuttleton and Mount Adrah. They will be complemented by two age-dating samples of mineralised intrusions from the Drake epithermal gold–silver field. The results will help establish whether mineralisation at Drake occurred as one event or synchronously with each subsequent cycle of volcanism.

Contact: Phil Blevin, phil.blevin@industry.nsw.gov.au, 02 4931 6585

Londonderry drillcore library extension update

The Londonderry drillcore library extension is complete except for minor items and is fully functional. Buildings and exteriors are complete, facilities are in place, drillcore has been relocated to the new racking and the database updated with new locations. This project came in on time and under budget. Watch the [Resources & Energy news website](#) for the official opening on 5th April 2016.

For access to drillcore contact: Steve Hall, steve.hall@industry.nsw.gov.au, 02 4777 0322



Londonderry drillcore library extension at the WB Clarke Geoscience Centre

List of drillcore accepted at Mineral Resources core libraries

View a [list of non-confidential drillcore accepted](#) at the [Londonderry Drillcore Library](#), November 2015–January 2016. It includes core from the Ardlethan and Bushranger deposits. No core was accepted at the [EC Andrews Drillcore facility](#), Broken Hill.

NSW Radiogenic Isotopes Database update

The GSNSW has updated its radiogenic isotopes database with 51 new age determinations (34 U–Pb igneous, 11 U–Pb sedimentary provenance, 2 Ar–Ar and 4 Rb–Sr) from internal and external published sources.

References to date include:

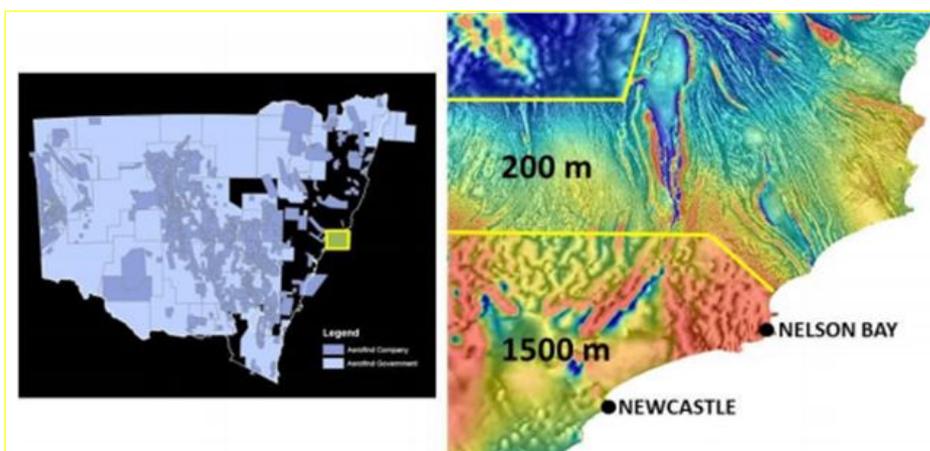
- Waltenberg, K., Blevin, P. L., Bodorkos, S. & Cronin, D. E. 2015. New SHRIMP U–Pb zircon ages from the New England Orogen, New South Wales: July 2014–June 2015. Record 2015/28. Geoscience Australia; [Geological Survey Report GS2015/1124](#).
- Barry C. 2015. U–Pb LAICPMS geochronology of cassiterites from New South Wales and the Northern Territory, Australia. [Geological Survey Report GS2016/0206](#).
- Roberts J., Clauoué-Long J. C. & Foster C. B. 1996. SHRIMP zircon dating of the Permian System of eastern Australia, Australian Journal of Earth Sciences, 43:4, 401–421.
- Campbell M., Rosenbaum G., Shaanan U., Fielding C. R. & Allen C. 2015. The tectonic significance of lower Permian successions in the Texas Orocline (Eastern Australia), Australian Journal of Earth Sciences, 62:7, 789–806.
- Rosenbaum G., Uysal I.T. & Babaahmadi A. 2015. The Red Rock Fault zone (northeast New South Wales): kinematics, timing of deformation and relationships to the New England oroclines, Australian Journal of Earth Sciences, 62:4, 409–423.
- Shaanan U., Rosenbaum G. & Wormald R. 2015a. Provenance of the Early Permian Nambucca block (eastern Australia) and implication for the role of trench retreat in accretionary orogens. Geological Society of America Bulletin 127, 1052–1063.

The new and existing data is available through the [Geoscientific Data Warehouse](#).

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Company geophysics makes a difference

Open file geophysics submitted to GSNSW by companies makes a big difference to the data made available by GSNSW to industry, as demonstrated below through the [GSNSW AEROFIND database](#).



Left: Distribution of company (dark toned) and government airborne geophysical surveys in our NSW datasets in AEROFIND.

Right: A recently stitched company aeromagnetic survey north of Newcastle shows distinct detail of the new data with flight line spacing of 200 m (inset), contrasting sharply with the existing low resolution 1500 m-spaced data.

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Improved Management of Exploration Regulation (IMER)

Changes came into effect on 1 March 2016 to bring the *Mining Act 1992* and the *Petroleum (Onshore) Act 1991* into closer alignment regarding administration of titles, compliance and enforcement. They create greater consistency for the administration of exploration, assessment and production titles across all resources to ensure that industry and the community are aware of the standards that must be met for an application to be granted.

[All exploration guidelines](#) have been updated. The annual activity summary and expenditure tables for [coal](#) and [minerals](#) have been updated and apply to authorities granted, renewed or transferred from applications lodged since 1 July 2015. [Petroleum authority holders have new templates](#).

- [A new strategic release framework](#)
- [Land Resources Legislation](#)
- [Changes to Work Health and Safety \(Mines and Petroleum\)](#)

[Subscribe to IMER updates](#). Go to the [IMER webpage](#)

GSNSW research

[Geological Survey Report GS2015/1395](#) on 'Petrological and geochemical evidence of metasomatism and the nature of the calcic progenitor rock at the Doradilla prospect, New South Wales' by Gary Burton is available in [DIGS](#).

Contact: Gary Burton, gary.burton@industry.nsw.gov.au, 02 6360 5330

[Geological Survey Report GS2015/1290](#) on 'Preliminary observations of volcanic facies in the Gurrang Volcanics, East Riverina map area' by Kate Bull is available in [DIGS](#).

Contact: Kate Bull, kate.bull@industry.nsw.gov.au, 02 4931 6508

Bob Musgrave is integrating the potential field model for the Gilmore Fault Zone created by Deepika Venkataramani (MSc student at University of Newcastle) with kinematic and tectonic interpretations for the region. He is currently preparing a case study guide to interpreting complex magnetostratigraphy.

Contact: Robert Musgrave, robert.musgrave@industry.nsw.gov.au, 02 4931 6725

Yong Yi Zhen and Ian Percival have documented a newly discovered conodont fauna and associated tabulate corals from the Late Ordovician Angullong Formation of central NSW. The biostratigraphy resulting from these studies supports detailed regional correlation throughout the Tasmanides from

the Macquarie Volcanic Province of central NSW through the New England Orogen to the Mossman Orogen of far northern Queensland.

They recently published: Zhen, Y.Y, Percival, I.G. & Molloy, P.D., 2015. Late Ordovician conodonts and brachiopods from near Greenvale in the Broken River Province, north Queensland. *Proceedings of the Linnean Society of New South Wales* 137, 57–105.

Contact: Yong-yi zhen, yong-yi.zhen@industry.nsw.gov.au

International Pint of Science festival, 23–25 May, Newcastle

Dr Bob Musgrave, research scientist with GSNSW, will be speaking on "Scientific drilling at the bottom of the ocean" at the [International Pint of Science festival](#) in Newcastle. The festival is held in pubs and is about people discussing science research with the researchers in an informal environment.

Dr Musgrave will be at 'The Edwards', 148 Parry Street, Newcastle, 7–9.30 pm on 24th May.

Geological Survey showcased at SMEDG, Nov 2015

GSNSW staff presented an overview of the Geological Survey's structure and key projects at the Sydney Mining and Exploration Discussion Group in November, 2015. The GSNSW executive also met with NSW mineral explorers and listened to their comments and feedback.

[View the presentations](#)

Upcoming conferences

[Mines & Money Hong Kong 2016, 14–18 March, Hong Kong](#)

[Exploration in the House, 1–6pm, 3rd May, Parliament House, Sydney](#)

[NSW Exploration Data Workshop, \(EITH2016, 8.30am –12pm\), 3rd May, State Library, Sydney](#)

[NSW Minerals Council Forum, 4 May, Parliament House, Sydney](#)

[RIU Sydney Resources Round-up 11–12 May, Sydney](#)

[International Pint of Science Festival, 23–25 May, Newcastle](#)

[Resources Investment Symposium, 24–27 May, Broken Hill](#)

[APPEA Conference & Exhibition 2016, 5–8 June, Melbourne](#)

[AMEC Convention 2016, 8–9 June, Perth](#)

[AESC 2016, 26–30 June, Adelaide](#)

[Palaeo Down Under 2, 11–15 July, Adelaide](#)

[ASEG–PESA 2016, 21–24 August, Adelaide](#)

Staff movements

Ben Nicholson has accepted the position of Senior Geospatial Officer, Geoscience Information

Trevor Barlin has accepted the position of Project Manager, Geoscience Information

Brad Ilg has resigned from his position of Director, Geoscience Information

Cameron Perks has resigned from his position of Geoscientist, Minerals & Land Use Assessment

Simon Francis has resigned from his position of Senior Geoscientist, Minerals & Land Use Assessment

Products

[Digital Imaging Geoscientific Systems \(DIGS\)](#)

[Geophysical images and data](#)

[Online sales: www.shop.nsw.gov.au](http://www.shop.nsw.gov.au)

[Quarterly Notes](#)

Enquiries

Maps and data packages: geoscience.products@industry.nsw.gov.au Tel: 02 4931 6426

Geophysical images and data: geophysics.products@industry.nsw.gov.au Tel: 02 4931 6717

Counter sales: mineralpublication.orders@industry.nsw.gov.au Free call: 1300 736 122 Tel: 02 4931 6666

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GSNSW: www.resourcesandenergy.nsw.gov.au/miners-and-explorers/geoscience-information

Newsletter compilation: Joan Henley, outcrop.newsletter@industry.nsw.gov.au

View previous issues: www.resourcesandenergy.nsw.gov.au/miners-and-explorers/geoscience-information/products-and-data/books-and-brochures/newsletter

Visit the [Geoscience Information webpages](#) where you will find access to online systems DIGS[®], MinView, EROL, GDW and GPC, upcoming GSNSW events, news, publications and product information.

To subscribe to Quarterly Notes: Geneve Cox, geneve.cox@industry.nsw.gov.au

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (March, 2016). However, because of advances in knowledge, users are reminded of the need to ensure that information on which they rely is up to date and to check the currency of the information with the appropriate officer of NSW Department of Industry, Skills & Regional Development or the user's independent advisor.

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