

Successful Co-funded Drilling projects announced

The 62 projects which were successful in gaining co-funding from the second round of the Co-funded Exploration Drilling program for drilling to be undertaken in 2010–11, were announced recently. The Co-funded Exploration Drilling program is a key component of the five-year \$80 million Exploration Incentive Scheme (EIS) funded from Royalties for Regions.

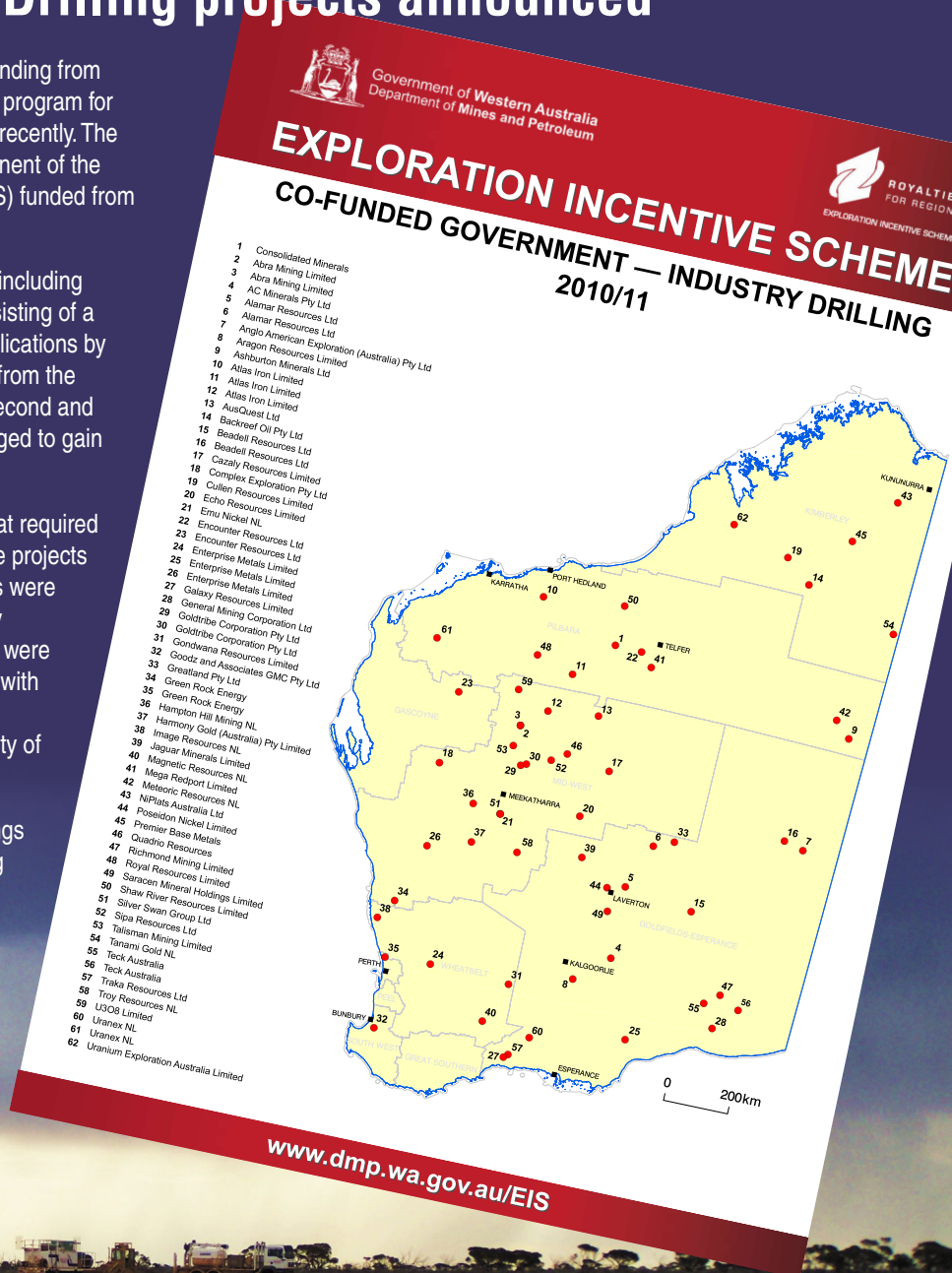
A number of innovations were introduced in this round including an increase in co-funding to \$200 000 for projects consisting of a single deep hole, a special category introduced for applications by prospectors and handicapping of multiple applications from the same applicant. Despite the handicapping applied to second and subsequent applications, several companies still managed to gain co-funding for two or three projects.

Applications were submitted using an online system that required applicants to address a number of criteria related to the projects for which they were seeking co-funding. All applications were assessed against these criteria and were subsequently ranked according to their total score. The assessments were undertaken by a small team of independent geologists with significant exploration industry experience. This online submission process resulted in an increase in the quality of applications.

The process of assessment and the subsequent rankings were endorsed by an Advisory Committee representing AMEC, the Chamber of Minerals and Energy WA, Australian Petroleum Production & Exploration Association (APPEA), the Amalgamated Prospectors and Leaseholders Association of Western Australia (APLA), as well as the research sector.

Once again, an independent probity auditor endorsed the integrity of the process.

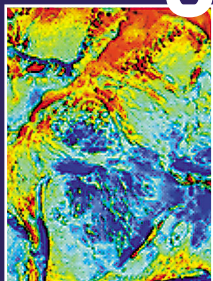
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www.dmp.wa.gov.au/EIS

Photograph courtesy of Gunson Resources

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What's inside?

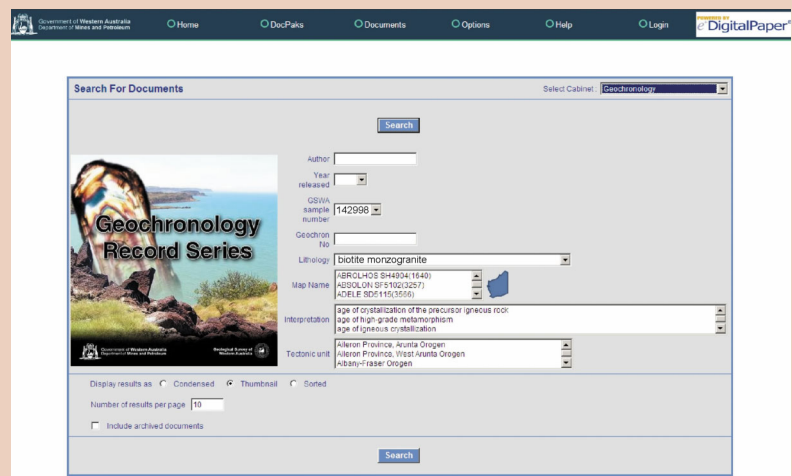
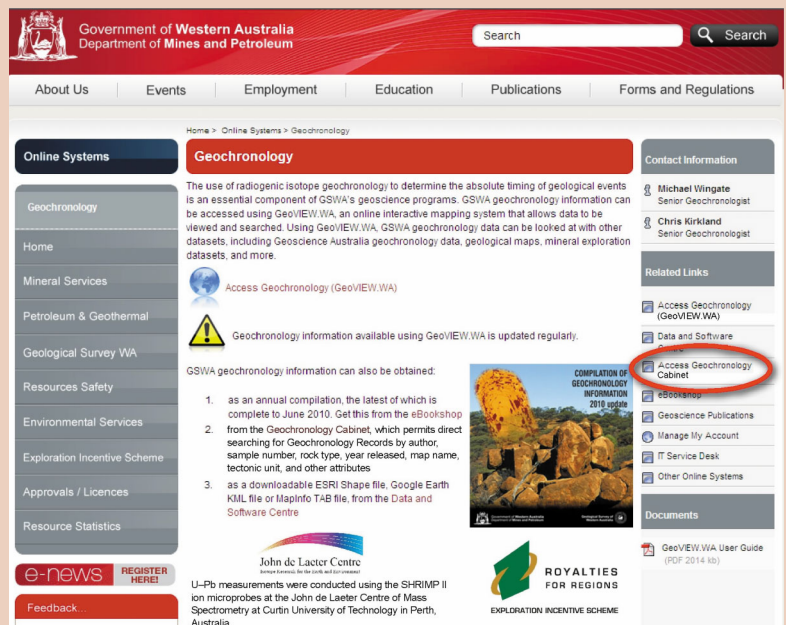
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New GSWA Geochronology cabinet on DMP website

The Geochronology section of the DMP website has recently added a new searchable cabinet for Geochronology Records. This allows users to search by author, year released, sample number, rock type, map name, tectonic unit, and interpretation (geological event dated) for the many rock ages (currently about 1000) across Western Australia that have been acquired since 1995. Another function to be added soon is the ability to search by age range; for example, users will be able to look for all rocks dated between 1800 and 2200 Ma (Ma = million years).

Login to the DMP website, and move the cursor over 'Online Systems' – then choose 'Geochronology' from the flyout box that appears. On the right hand side of the Geochronology page, click on the button to 'Access Geochronology Cabinet'. Geochronology Records can be viewed online or downloaded as PDF files. The Geochronology cabinet complements the online interactive mapping system GeoVIEW.WA, which allows geochronology data to be viewed in a spatial context, together with other datasets. Geochronology information available using the Geochronology cabinet or GeoVIEW.WA is updated regularly.

For more information, contact Michael Wingate (michael.wingate@dmp.wa.gov.au).



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Successful applications were well distributed across the state and covered most commodities.

Particularly pleasing is that among the successful projects this year are two geothermal projects, showing commitment to supporting development of alternative energy sources. Other successful energy applications include one coal and one onshore oil and natural gas project.

Gold is the mineral featuring in the largest number of applications with 29 projects listing gold as the main or one of the commodities sought, followed by copper in 22 projects. Other commodities being targeted are nickel and uranium, both in 11 projects, as well as manganese, silver, iron, zinc, cobalt, lead and PGEs.

Three projects are being co-funded to \$200 000 as they will be drilling deep holes to 1500 metres or deeper.

The core obtained from drill holes funded by the program must be submitted to one of the Department's core libraries and will be

made available to the public. Most successful applicants were small exploration companies. Further co-funding will be available in future years with about \$6 million on offer in 2011–12.

Details of this next round of co-funded drilling will be advertised later this year.

Keep an eye on our website <<http://www.dmp.wa.gov.au/EIS>> for all the latest news.

For more information, contact Margaret Ellis (margaret.ellis@dmp.wa.gov.au).

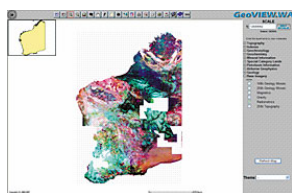
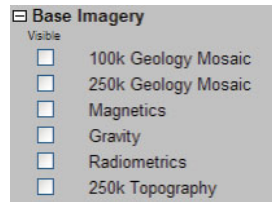


GeoVIEW.WA enhanced with new updates

GeoVIEW.WA was first made available in 2001 and continues to expand with valuable State-wide geoscientific and related datasets that are updated on a regular basis. There are now 75 datasets featured on GeoVIEW.WA.

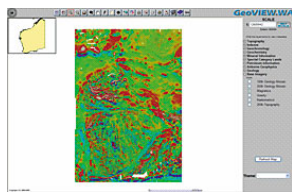
New Base Imagery category

Recently a new category 'Base Imagery' was added. This category contains statewide raster datasets and associated metadata. It includes the following:



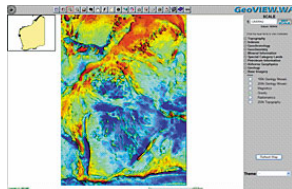
1. Radiometrics

2009 radiometric anomaly grids (100 m) were generated when the Western Australia portion of the grids from Geoscience Australia's Radiometric Map of Australia (2009) was updated with data from 23 more recently available government and open file surveys.



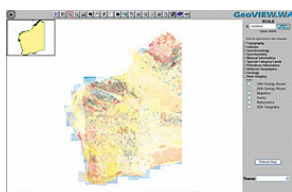
2. Magnetics

2010 magnetic anomaly grid (80 m). This merged magnetic anomaly grid is generated from Federal and State government datasets acquired with a line spacing of 500 metres or less and selected open file data sets.



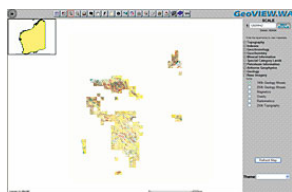
3. Gravity

2009 Bouguer Gravity anomaly image was compiled from the Australian National Gravity Database 0.5 minute grid and image generated from a colour palette (white high, blue low) using a linear histogram.



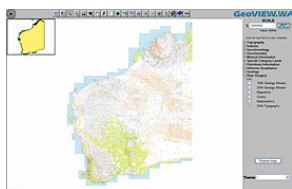
4. 1:250 000 Geology mosaic

This image was compiled by stitching together the latest versions of 1:250 000 geological maps covering Western Australia.



5. 1:100 000 Geology mosaic

This image was compiled by stitching together the latest versions of 1:100 000 geological maps covering Western Australia.



6. 1:250 000 Topography

was derived from the 1:250 000 scale Geoscience Australia NATMAPS.

ADDITIONAL GEOCHRONOLOGY and CORE LIBRARY DATA

GSWA geochronology data contained in GeoVIEW.WA has been improved and now includes links to the raw data files which can be downloaded as a text file and interrogated. It also links directly to the compiled reports for a particular geochronology record.

The Core Library Drill Holes layer has been updated to identify if core is stored in the Kalgoorlie Core Library or the Perth Core Library at Carlisle. For most drill core records there is a hyperlink that will take you to the open file report where the drill hole was recorded.

GeochronID	Lithology	Tectonic Unit	Age	Uncertainty	Confidence Level	Interpretation	Isotopic Data	Analysis	Report Doc
184802.1	Basaltic dike monzonite	Charles Tarnum Group	1720	5	95%	Age of igneous crystallization	U-Pb zircon	184802.1.pdf	184802.1.pdf
184802.1	Basaltic dike monzonite	Charles Tarnum Group	1720	5	95%	Maximum age to deposition of sedimentary rocks	U-Pb zircon	184802.1.pdf	184802.1.pdf
184802.1	Basaltic dike monzonite	Charles Tarnum Group	1720	5	95%	Maximum age to deposition of sedimentary rocks	U-Pb zircon	184802.1.pdf	184802.1.pdf
184802.1	Basaltic dike monzonite	Charles Tarnum Group	1720	5	95%	Maximum age to deposition of sedimentary rocks	U-Pb zircon	184802.1.pdf	184802.1.pdf

Hyperlink to data file is contained within the GeochronID in above window.

GeochronID	Gpsno	Spotno	Grainspot	238U (ppm)	232Th (ppm)	232Th/238U	ε (‰)	238U/206Pb
184802.1	I	17	17.1	348	313	0.93	0.066	3.204
184802.1	I	3	3.1	421	288	0.71	0.005	3.176
184802.1	I	14	14.1	364	241	0.68	0.036	3.232
184802.1	I	1	1.1	379	277	0.76	0.091	3.176
184802.1	I	11	11.1	342	294	0.89	0.283	3.291
184802.1	I	18	18.1	1556	99	0.07	0.063	3.188
184802.1	X	6	6.1	568	178	0.32	0.024	1.775
184802.1	X	8	8.1	2540	46	0.02	0.015	1.891
184802.1	X	10	10.1	189	86	0.47	0.095	2.129
184802.1	X	13	13.1	789	82	0.11	0.012	2.176
184802.1	X	19	19.1	538	364	0.70	0.080	2.876
184802.1	X	15	15.1	709	561	0.82	-0.006	2.797
184802.1	X	20	20.1	112	39	0.36	0.426	2.988
184802.1	X	9	9.1	880	156	0.18	0.008	2.950
184802.1	X	5	5.1	307	147	0.49	0.013	3.193
184802.1	X	4	4.1	525	157	0.31	0.020	3.021
184802.1	X	7	7.1	1513	548	0.37	0.011	3.055
184802.1	X	12	12.1	538	193	0.37	0.037	3.020
184802.1	X	2	2.1	233	96	0.43	0.069	3.165
184802.1	X	16	16.1	610	46	0.08	0.021	3.201

Resultant data file when GeochronID is selected.

Other datasets recently added include:

- Ashmore Cartier boundaries
- Mining Act Section 19 areas
- proposed Kimberley national heritage area
- geothermal titles
- geothermal title applications
- geothermal acreage releases

For more information, contact
Darren Wallace (darren.wallace@dmp.wa.gov.au) or
Joel D'Antoine (joel.d'antoine@dmp.wa.gov.au).

Seismic traverses provide new understanding of the crustal structure of Western Australia

New government funding is allowing some exciting deep seismic reflection surveys across under-explored parts of the Pilbara, Gascoyne and Mid-West regions. The Capricorn and Youanmi surveys carried out from April to early July 2010 are shown on the adjacent maps.

The surveys are funded through the Western Australian Government's Exploration Incentive Scheme (EIS) and through the Australian Federal Government's National Earth Science Infrastructure Program (AuScope). Acquisition and interpretation is being managed by Geoscience Australia (GA) and ANSIR through the National Geoscience Agreement. This activity, adding to a network of existing deep seismic traverses, will improve understanding of the crustal structure of Western Australia.

A private sub-contractor, Terrex Seismic Pty Ltd, is carrying out the seismic data acquisition.



Capricorn traverse ①

The Capricorn deep crustal seismic line crosses the Capricorn Orogen, a major tectonic zone between the Archean Yilgarn and Pilbara Cratons, which is marked by more than one billion years of episodic reworking. The line crosses two Proterozoic sutures and several sedimentary basins, including the Hamersley Basin, host to giant iron ore deposits. The southern part of the traverse will follow the same line as a magnetotelluric (MT) survey carried out in 2006 (see map) as a joint project between GSWA and The University of Adelaide (Selway, 2008: GSWA Record 2007/16).

The main features interpreted from the MT survey shown in the accompanying cross section are:

1. a moderately resistive Gascoyne Province between highly resistive Yilgarn and Pilbara Cratons
2. the Errabiddy Shear Zone dips moderately to the south
3. the contact between the Pilbara Craton and Gascoyne Province is steep and coincides with the Talga Fault.

Objectives

The main objectives for the Capricorn seismic line are to image:

- ① the overall structure and dip of the suture between the Yilgarn Craton and Gascoyne Province (Errabiddy Shear Zone)
- ② the depth and shape of the Minnie Creek batholith
- ③ the nature of reactivated Fortescue Group growth faults in the southern Pilbara
- ④ the dip of major faults that mark the boundary between the Pilbara Craton and the Ashburton Basin
- ⑤ the deep crustal structure of the Ashburton Basin
- ⑥ the deep crustal structure of the Edmund and Collier Basins and nature of major growth faults, e.g. the Talga Fault.

Youanmi traverse ②

The Youanmi traverse aims to extend the Capricorn traverse across the northwest Yilgarn Craton to the Ida Fault, which marks the boundary between the Youanmi Terrane and the Eastern Goldfields Superterrane. Together with the previously acquired Leonora–Laverton line (01AGS–NY1), it will provide a complete section across the Yilgarn Craton.

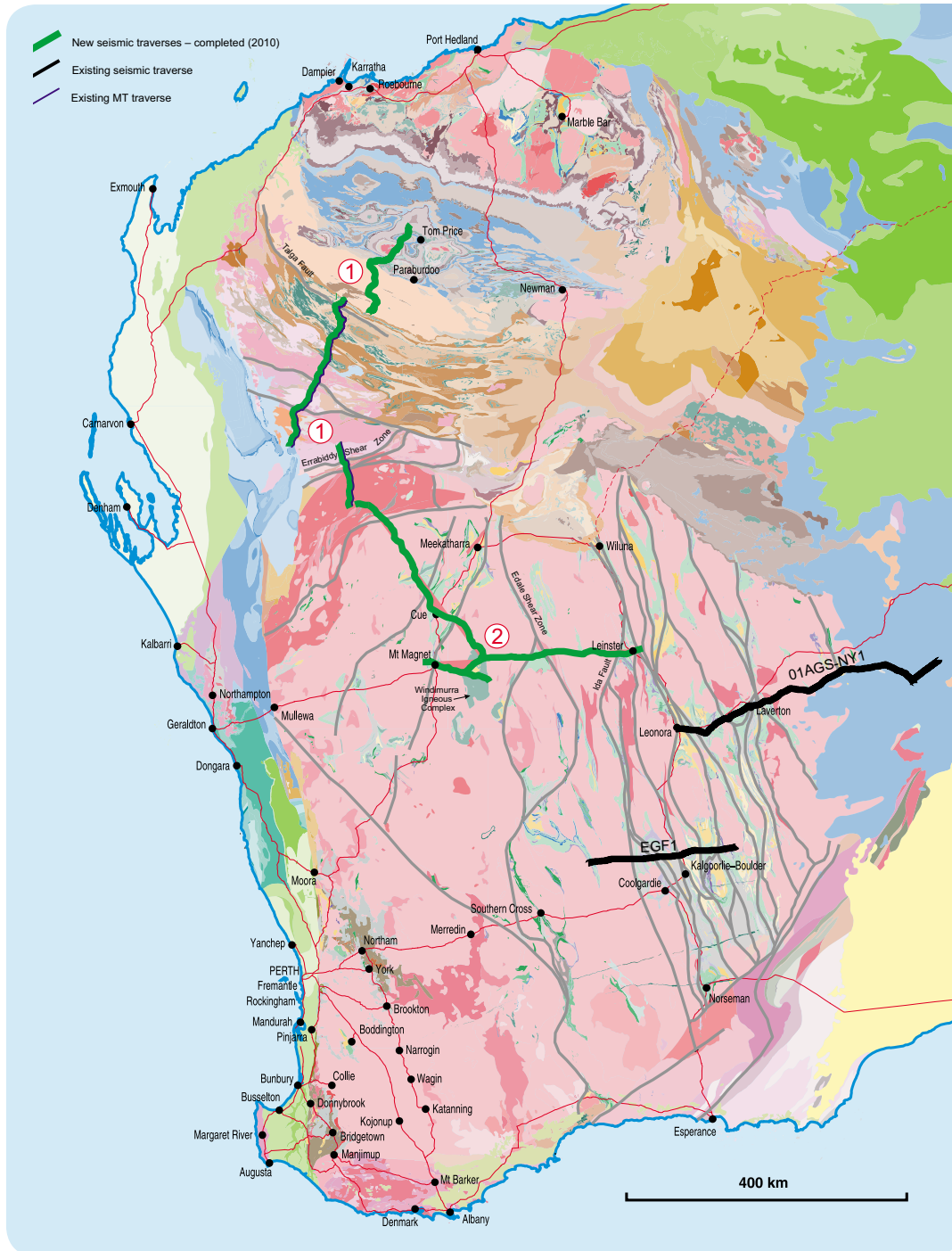
The line will cross a possible late Archean suture separating the old rocks (up to 3.73 Ga) of the Narryer Terrane from the younger Youanmi Terrane (3.0–2.6 Ga). The Meekatharra structural zone is a focus of gold mineralization and the intrusion of large layered mafic–ultramafic intrusions and may represent a 2.8 Ga rift.

Objectives

The main objectives for the Youanmi seismic line are to:

- ① complete a seismic transect across the Yilgarn Craton by adding data to the west from the earlier Eastern Goldfields seismic traverses
- ② determine the nature of the contact between the Youanmi and Narryer Terranes by imaging the major regional structures along the contact
- ③ image the Meekatharra structural corridor
- ④ image major Terrane- and Domain-bounding faults such as the Ida Fault and the Youanmi Shear Zone, and other major regional structures such as the Edale Shear Zone
- ⑤ investigate the 3D structure of the Windimurra Igneous Complex
- ⑥ determine the depth and 3D shape of supracrustal (greenstone) successions.

Seismic traverses 2010



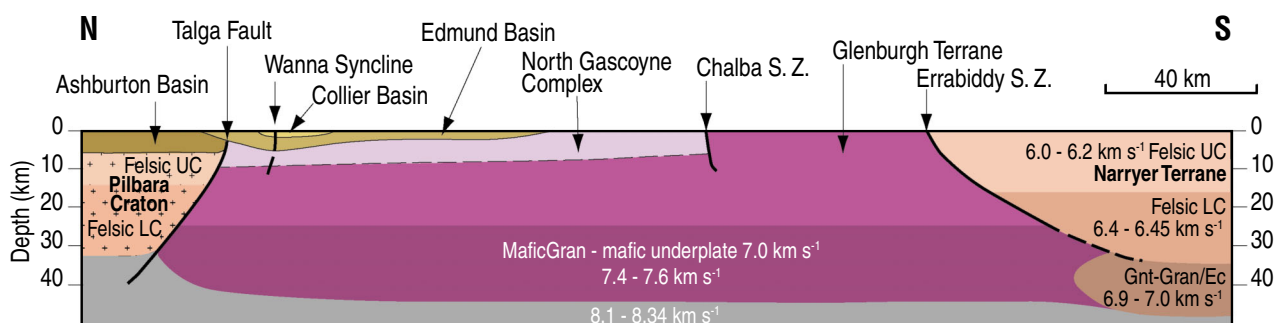
Vibroseis truck generating seismic waves in the southern Gascoyne (above and below)



Shooting a line



Collecting geophone array



Summary cross section through the Capricorn Orogen from MT modelling combined with previously published passive seismic data.

Ian Williams honoured by fossil name

Former regional mapper Ian Williams, who died in November 2007 shortly after retiring from GSWA, has been honoured by a fossil name. Ian discovered *Horodyskia williamsii*, otherwise known as the 'string of beads', in the Mesoproterozoic Stag Arrow Formation (Manganese Group, the then "Bangemall Basin") when mapping BALFOUR DOWNS in the late 1980s.



Ian Williams

Ian and paleontologist Kath Grey published on the enigmatic structures in 1990, discussing evidence for their biogenicity and comparing them to similar, but older (c.1.4 Ga), structures in the Belt Supergroup of North America that were subsequently named *Horodyskia* for their discoverer, Robert Horodyski.

Ian later found more localities on ROBERTSON, COLLIER and MOUNT EGERTON, and David Martin, another former GSWA mapper, traced the horizon onto TUREE CREEK, publishing papers describing their sedimentological setting. Localities are all in either the Stag Arrow or Backdoor (Collier Group) Formations which are probable correlatives, and now number nearly 50, extending across 450 km. In 2000, Ian Williams led an international expedition to key sites.



Outcrop at Collier

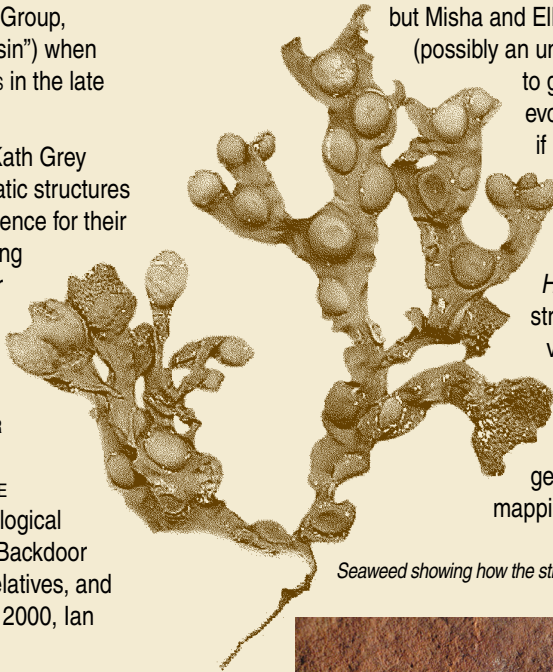
The fossil was named by Kath Grey, David Martin, Academician Misha Fedonkin, now Director of the Geological Institute, Russian Academy of Sciences, and USA paleontologist, the late Ellis Yochelson, formerly of the Smithsonian Museum of Natural History, in Precambrian Research. A second paper in the same issue, by Clive Calver, Kath Grey, and Marty Laan, announces the discovery of *H. williamsii* in the Rocky Cape Group of Tasmania.

H. williamsii is present in huge numbers at each locality and consists of small, serially aligned, uniformly spaced pits, 1–3 mm in diameter, in a string up to 15 cm long. Impressions indicate a hard wall that wrinkled and dimpled during preservation and in rare specimens a strand connects the pits. Beads are normally preserved as sole marks, but are sometimes present on bedding planes, demonstrating that they were originally spherical.

Horodyskia williamsii is of considerable interest to evolutionary paleobiologists, although its origins remain controversial. Some scientists believe it is abiogenic; others suggest it is a product of archaea and cyanobacteria. Even the authors could not agree on the affinities of the new species. Kath and Ian originally interpreted *H. williamsii* as a metaphyte, probably seaweed (a view Kath still considers valid), but Misha and Ellis suspected it could be animal

(possibly an unknown hydrozoan, a group related to graptolites). Accepted theories about evolutionary pathways will be overturned if *H. williamsii* is animal rather than plant, because animals would have evolved c.700 my earlier than known unequivocal traces.

Horodyskia williamsii appears stratigraphically restricted, so is a valuable marker in rocks otherwise difficult to correlate. Naming the fossil after Ian Williams is a fitting tribute to its discoverer and to a geologist who dedicated his life to mapping large areas of Western Australia.



Seaweed showing how the structure may have looked



Slab containing the beads



A close-up of the holotype

For more information, contact Kath Grey (kath.grey@dmp.wa.gov.au).

Western Australia regional geophysics surveys 2010: July update

Data access



Download final data releases from the Geoscience Australia Data Delivery System at <<http://www.ga.gov.au/gadds>>.

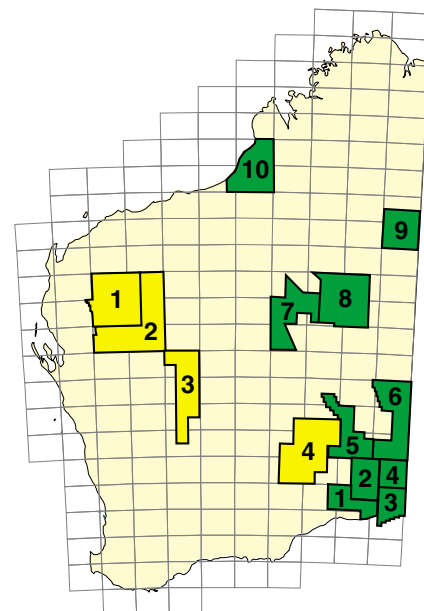
Download preliminary and final grids and images from the GSWA website at <<http://www.dmp.wa.gov.au/geophysics>>.

Subscribe to the GSWA mailing list to keep informed of preliminary and final data release dates.

For more information, contact David Howard
(david.howard@dmp.wa.gov.au).



 Airborne survey
 Ground survey



Airborne magnetic and radiometric surveys

ID	Area/Name	Lines	Size (km)	Status	Start	End	Release
1	Madura 2010	200 m; E/W	102 000	Contract	Jul-10*	Oct-10*	Jan-11*
2	Loongana 2010	200 m; E/W	113 000	Contract	Jul-10*	Nov-10*	Feb-11*
3	Eucla 2010	200 m; N/S	88 000	Contract	Jul-10*	Sep-10*	Dec-10*
4	Forrest 2010	200 m; N/S	75 000	Contract	Jul-10*	Sep-10*	Dec-10*
5	Jubilee 2010	200 m; N/S	180 000	Contract	Jul-10*	Jan-11*	Apr-11*
6	Waigen–Mason 2010	400 m; N/S	113 000	Contract	Jul-10*	Nov-10*	Feb-11*
7	Madley–Herbert 2010	400 m; N/S	95 000	Contract	Jul-10*	Oct-10*	Jan-11*
8	Morris–Cobb 2010	400 m; N/S	125 000	Contract	Jul-10*	Dec-10*	Mar-11*
9	Stansmore 2010	200–400 m; N/S	114 000	Contract	Jul-10*	Nov-10*	Feb-11*
10	Lagrange–Munro 2010	400 m; N/S	103 000	Contract	Jul-10*	Oct-10*	Jan-11*

Ground gravity surveys

ID	Area/Name	Spacing	Size (stns)	Status	Start	End	Release
1	Gascoyne North 2010	2.5 km grid	7 300	Processing	Mar-10	May-10	Jul-10*
2	Gascoyne South 2010	2.5 km grid	9 700	Planning	Aug-10*	Oct-10*	Dec-10*
3	Sandstone 2010	2.5 km grid	6 300	Planning	Aug-10*	Sep-10*	Nov-10*
4	Albany–Fraser North 2010	2.5 km grid	9 200	Planning	Aug-10*	Oct-10*	Dec-10*

Information current at: 23 June 2010

* Estimated date

AusGeo news

AusGeo News is Geoscience Australia's (GA's) quarterly news magazine. Each issue comprises geoscience-related features, brief articles about GA's research and initiatives, news about geoscience products and spatial data, and a calendar of coming seminars and conferences.

Issue No 98 is now available at <<http://www.ga.gov.au/ausgeonews/>>. Some articles related to Western Australia are listed below.



New opportunities for offshore petroleum exploration

2010 acreage release offers blocks in producing regions and in frontier areas



First acreage release in frontier Mentelle Basin

Significant potential to become new petroleum province



Estimating biodiversity with deep sea images

Towards a more comprehensive characterisation of the seafloor



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■ REPORTS

Report 106 Geochemistry, geochronology and petrogenesis of Mesoproterozoic felsic rocks in the west Musgrave Province, Central Australia, and implications for the Mesoproterozoic tectonic evolution of the region

by RH Smithies, HM Howard, PM Evins, CL Kirkland, DE Kelsey, M Hand, MTD Wingate, AS Collins, EA Belousova and S Allchurch

Report 108 The Paleoproterozoic Capricorn Orogeny: intracontinental reworking not continent–continent collision

by S Sheppard, S Bodorkos, SP Johnson, MTD Wingate and CL Kirkland

■ RECORDS

Record 2010/7 Application of SWIR spectroscopy in very low-grade metamorphic environments: a comparison with XRD methods

by MP Doublier, A Roache and S Potel

Record 2010/11 Mineral exploration drilling of Lot 352 Anzac Drive, Kalgoorlie: a site required for industrial development

by CJ Kojan

Record 2010/12 In situ U–Pb monazite and xenotime geochronology of the Abra polymetallic deposit and associated sedimentary and volcanic rocks, Bangemall Supergroup, Western Australia

by B Rasmussen, IR Fletcher, JR Muhling, C Gregory, AM Thorne, HN Cutten, F Pirajno and A Hell

Record 2010/13 Management plan for state geoheritage reserves

by K Grey, IR Roberts, J Bevan, AH Hickman and MJ Van Kranendonk

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Geology of the Coongan 1:100 000 sheet

by MJ Van Kranendonk

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by SS Romano

JUTSON 1:100 000 geological series map

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by CE Hall, MP Doublier and S Wyche

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TOPPIN 1:100 000 geological series map

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YAMARNA 1:100 000 geological series map

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MARBLE BAR 1:250 000 (3rd edition) by AH Hickman

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Dandaragan, titanium–zircon mineralization

Gingin, titanium–zircon mineralization

Hill River, titanium–zircon mineralization

Mingenew, titanium–zircon mineralization

Perth–Wooroloo, titanium–zircon mineralization

Wedge Island, titanium–zircon mineralization

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by RW Cooper and DJ Flint

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Available on DVD

■ DATA PACKAGE

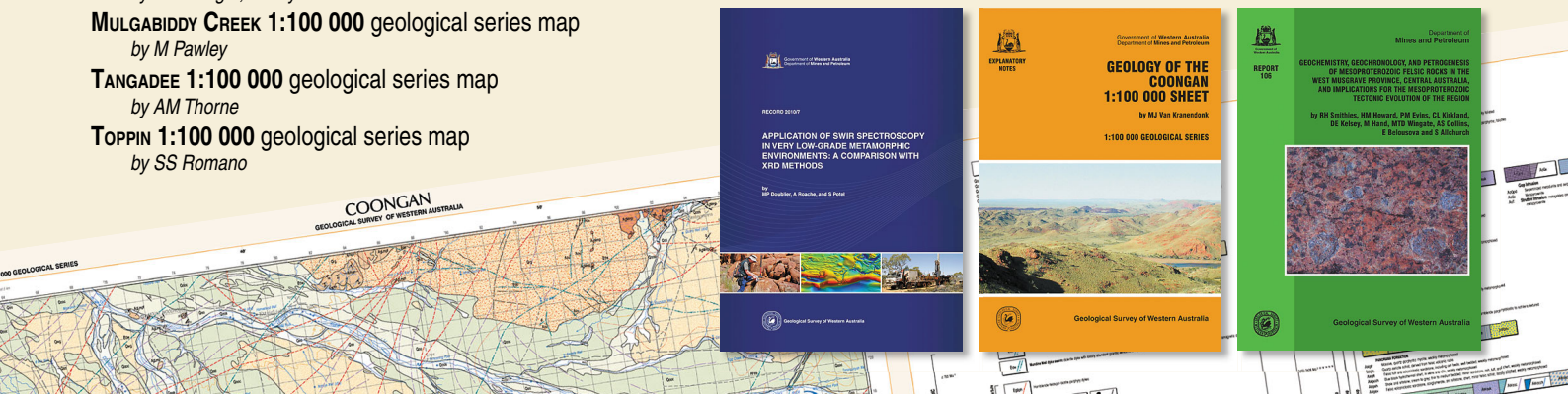
Quality controlled seismic data of the Southwest Canning Basin \$130

Available on external drive

■ DATA LAYER

East Wongatha regolith map by SA McGuinness

Available on East Yilgarn GIS DVD



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