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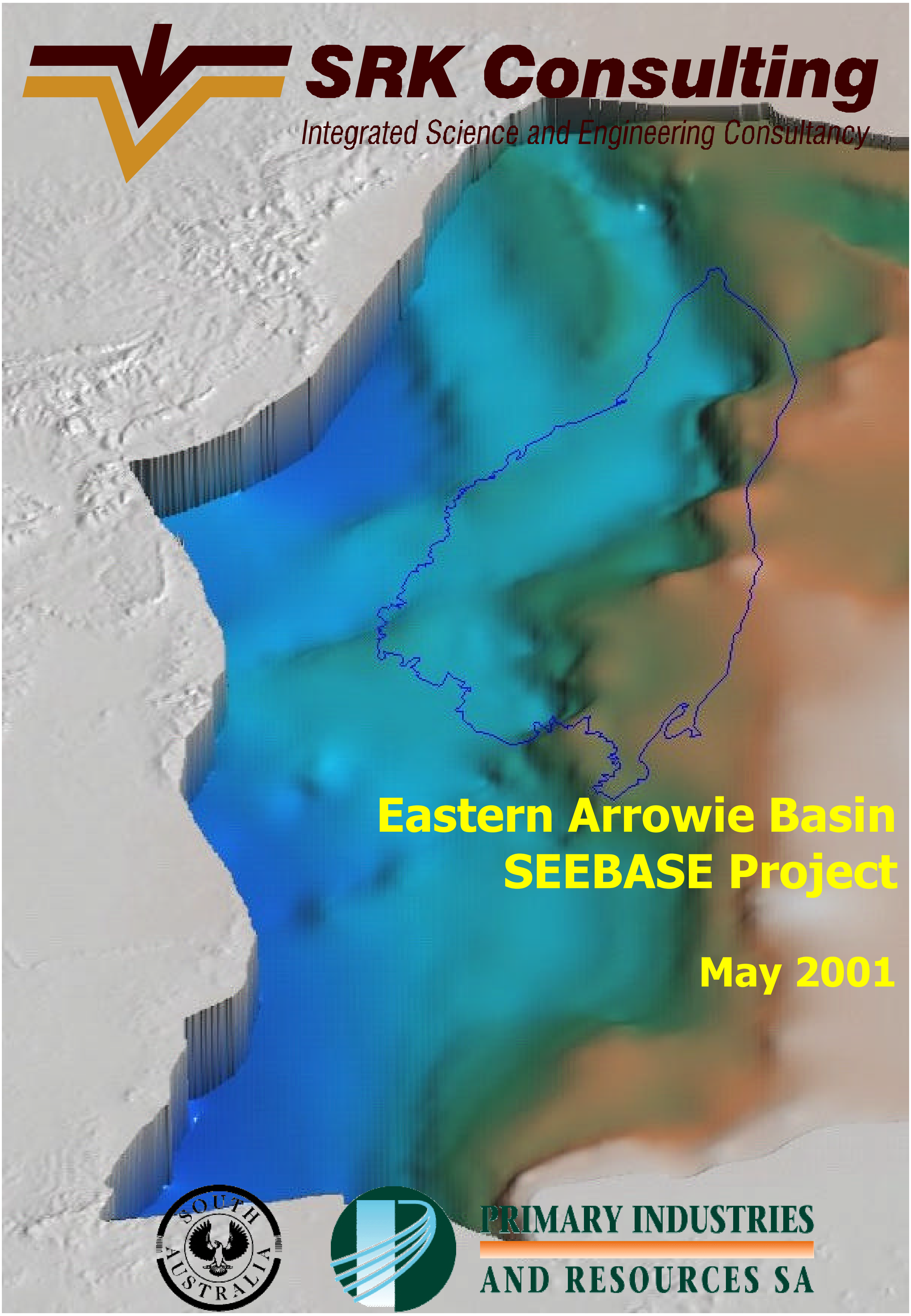

Eastern Arrowie Basin SEEBASE Project

May 2001

PRIMARY INDUSTRIES AND RESOURCES SA

SOUTH AUSTRALIA

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Eastern Arrowie Basin SEEBASE* Project

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*SEEBASE = Structurally Enhanced view of Economic Basement

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SRK Consulting
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Executive Summary

This project was initiated by PIRSA to augment their marketing campaign to attract new hydrocarbon explorers to the Arrowie by providing new insights into its geology and hence reduce exploration risk. SRK was contracted in March 2001 to provide an integrated regional interpretation of basement composition, structure and depth in the eastern Arrowie Basin, and investigate the effect of basement geology on basin evolution and petroleum systems.

SRK's approach primarily relies on the interpretation of magnetic and gravity data, calibrated with many other datasets including mapped geology, topography, event histories, wells and seismic. SRK utilizes a "bottom-up" approach to basin analysis, starting with a rigorous understanding of basement geology. By integrating the plate-scale kinematic event history for the area of interest, a interpretation of the basin's structural evolution through time can be mapped. Combined with a SEEBASE* map of depth to basement, this data can be used to understand basin phase distribution and petroleum systems.

The key findings of this project are as follows:

- The eastern Arrowie Basin overlies the Curnamona "Craton", a ~circular crustal block which was not deformed during the Delamerian Orogeny and is surrounded by Delamerian mobile belts.
- The Curnamona "Craton" was not significantly deformed in the Delamerian due to the presence of a large, strong mid-upper crustal Mesoproterozoic pluton.
- Basin architecture is controlled by new Neoproterozoic/Cambrian rift structures and reactivated basement structures.
- Four basin phases/tectonic events have shaped the Arrowie during the Neoproterozoic, early Paleozoic and Tertiary.
- A SEEBASE* model for the eastern Arrowie Basin shows basement topography, and can be used to map basin phase distribution, migration pathways and trap type/distribution.
- The geometry of the eastern Arrowie is dominated by a central basement ridge which separates two thick Neoproterozoic to Cambrian depocentres.
- Up to 4km of Neoproterozoic sediment fills the deeper parts of the eastern Arrowie.

*SEEBASE = Structurally Enhanced view of Economic Basement

Recommendations

• This projects provides new base to investigate the stratigraphic evolution of the eastern Arrowie Basin. A sequence stratigraphic study based on the structural framework and SEEBASE model presented here would provide new insights into its evolution and petroleum potential.

• More detailed SEEBASE study of prospective areas/permits integrating all available seismic data. The existing magnetic dataset can support more detailed work than done in this project, and a full seismic calibration would provide additional constraints on structural geometries at depth and reactivation histories.

• Acquire new seismic in the deeper parts of the Arrowie aimed at resolving basement and the thickness/geometry of the Adelaidean section.

Project Background

- The 1996 & 1999 PIRSA Petroleum Industry Surveys demonstrated that a perceived lack of knowledge and largely unfounded geological biases (e.g. poor source/reservoir quality, poor migration timing etc) were preventing petroleum companies from exploring in the Arrowie Basin.
- This project was initiated by PIRSA to augment their marketing campaign to attract new explorers to the Arrowie by providing new insights into its geology and hence reduce exploration risk. SRK Consulting was contracted by PIRSA in March 2001.
- This project was completed in 2 weeks' work by the SRK Energy Services team.

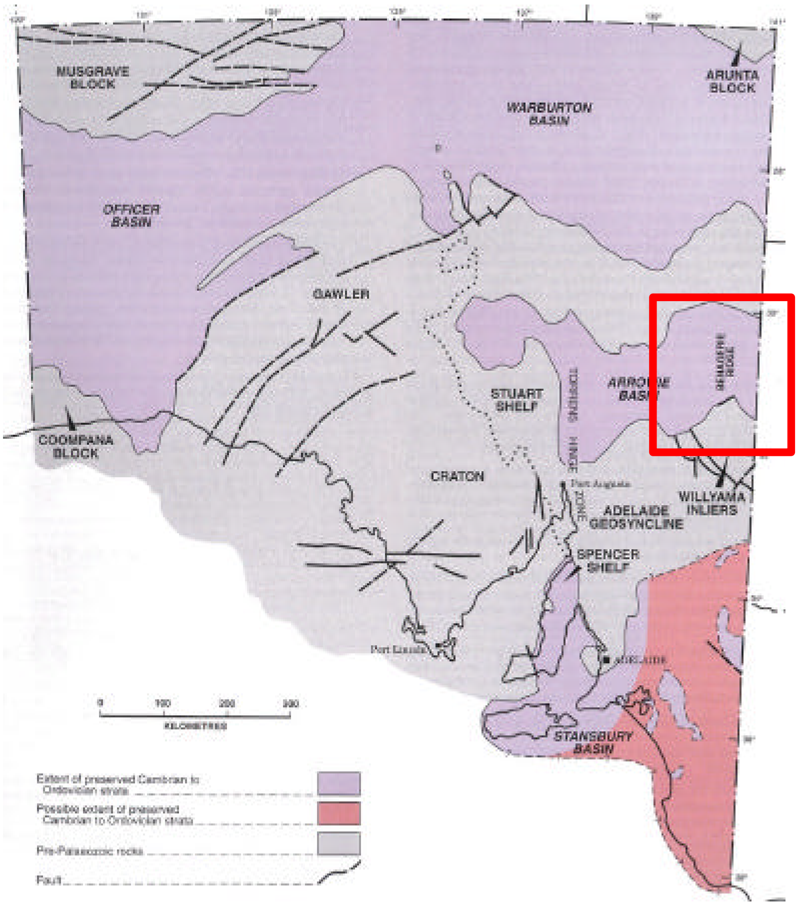
Project Aims

- To provide an integrated regional interpretation of basement composition, structure and depth in the Arrowie Basin, utilizing available gravity, magnetic, seismic and other data.
- To investigate the effects of basement geology on basin evolution and petroleum systems in the Arrowie Basin, focusing on structural evolution/reactivation, basin architecture and tectonic history.

Why SRK?

- SRK Consulting is one of the world's largest natural resource consultancies, with 22 offices in 5 continents.
- The SRK Energy Services group is based in Canberra, Australia. We are leaders in innovative, integrated geological interpretation of non-seismic and seismic data, principally magnetic and gravity data. We have worldwide experience in the petroleum, minerals and coal sectors.
- SRK Energy Services has worldwide experience in basin analysis, and has pioneered many new techniques for rapidly evaluating the structural framework and tectonic evolution of all types of basins, based largely on geopotential field data. SRK utilizes a "bottom-up" approach to basin analysis, starting with a rigorous understanding of basement geology. By integrating the plate-scale kinematic event history for the area of interest, a interpretation of the basin's structural evolution through time can be mapped. Combined with a SEEBASE* map of depth to basement, this data can be used to understand basin phase distribution and petroleum systems. (*SEEBASE = Structurally Enhanced view of Economic Basement)

Project Area



The project area is shown in the above map of the Cambrian of South Australia (from Drexel & Preiss, 1995). By definition, the Arrowie Basin includes all Cambrian sediment in the southern Adelaide Fold Belt. This study focusses on the relatively undeformed and unmetamorphosed part of the eastern Arrowie which overlies the Curnamona Craton.

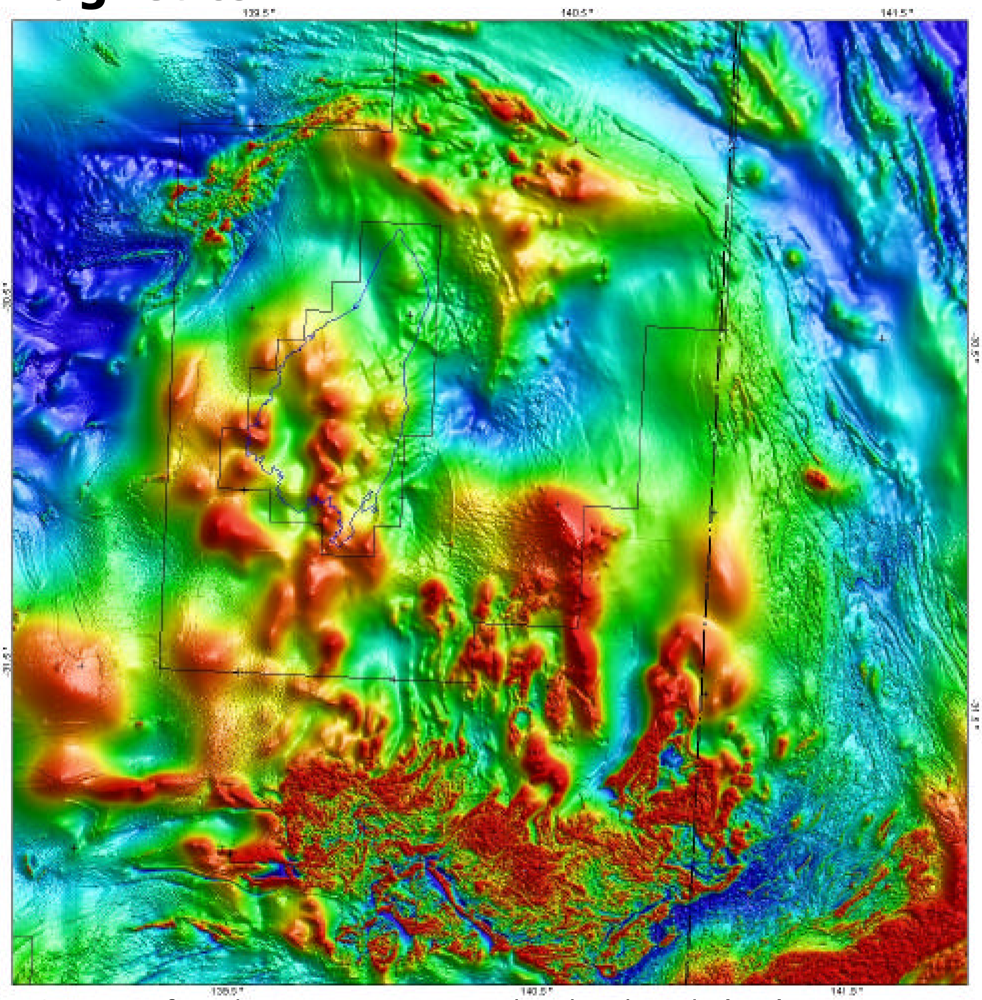
Datasets

The following datasets were provided by PIRSA for the Arrowie SEEBASE project:

- Bouguer Gravity (state 500m grid)
- Magnetics (state 100m grid)
- DEM (Auslig 9 sec)
- Seismic (mainly 1993 AGSO data)
- Wells (completion reports, summary logs)
- PIRSA Minerals GIS's (SA_GIS, Western Gawler Craton, Northern Gawler Craton)

In addition, SRK integrated its extensive in-house knowledge of Australian geology, published literature, and plate tectonic reconstructions.

Aeromagnetics



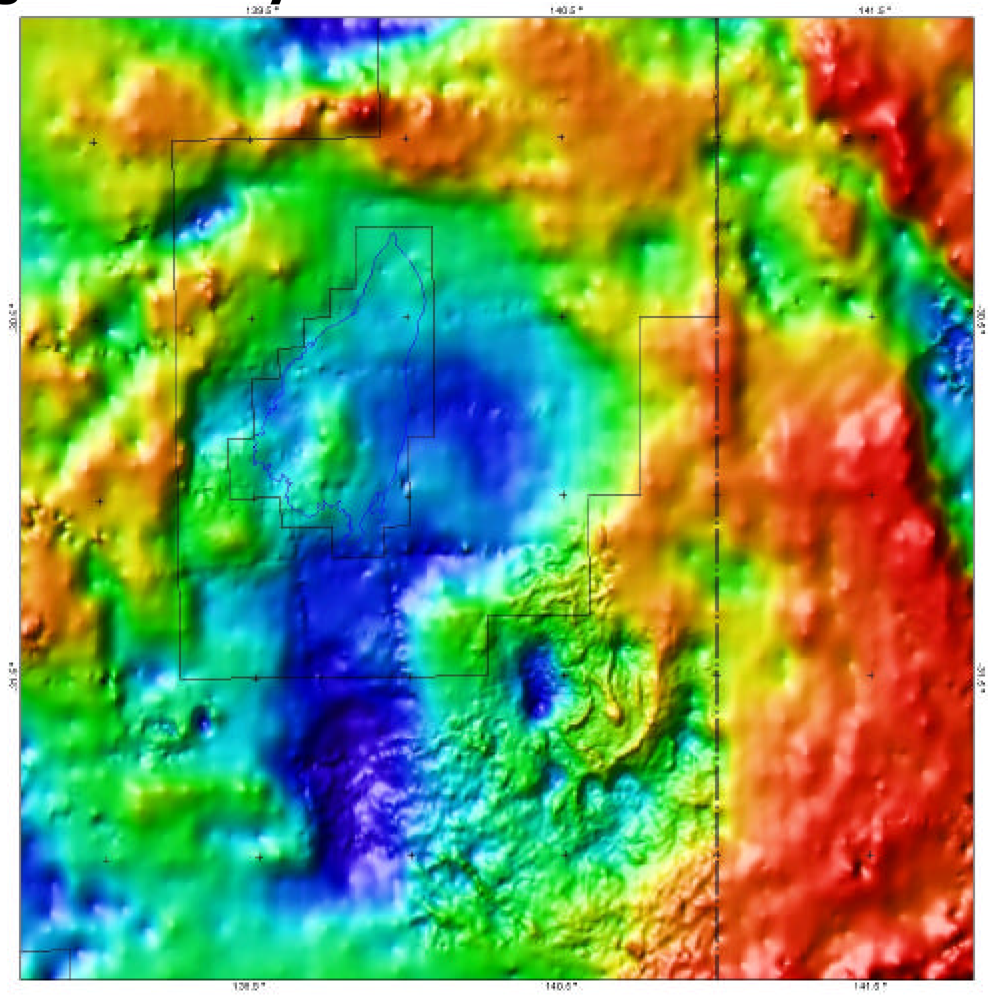
HSI image of Total Magnetic Intensity Reduced to the Pole (RTP)

Aeromagnetic data measures variations in the Earth's magnetic field caused by variations in the magnetic susceptibility of the underlying rocks. It provides information on the structure and composition of the magnetic basement. Most bodies within the basement have a distinctive magnetic signature which is characterised by the magnitude, heterogeneity and fabric of the magnetic signal. When calibrated with known geology, terranes can be mapped under a cover of sedimentary rock and/or water.

The most important and accurate information provided by magnetic data is the structural fabric of the basement. Major basement structures can be interpreted from consistent discontinuities and/or pattern breaks in the magnetic fabric. Once the structures have been evaluated and combined with those interpreted from the gravity data, a model for the evolution of the basement and overlying basins can be developed.

For the Arrowie Basin project, the SA state 100m stitched magnetic grid was reduced to the pole and imaged in ERMapper using a Hue-Saturation-Intensity colour model. Various enhancement filters were applied to resolve the geometry and structure of the basement at depth (e.g. 1st vertical derivative, automatic gain control).

Bouguer Gravity



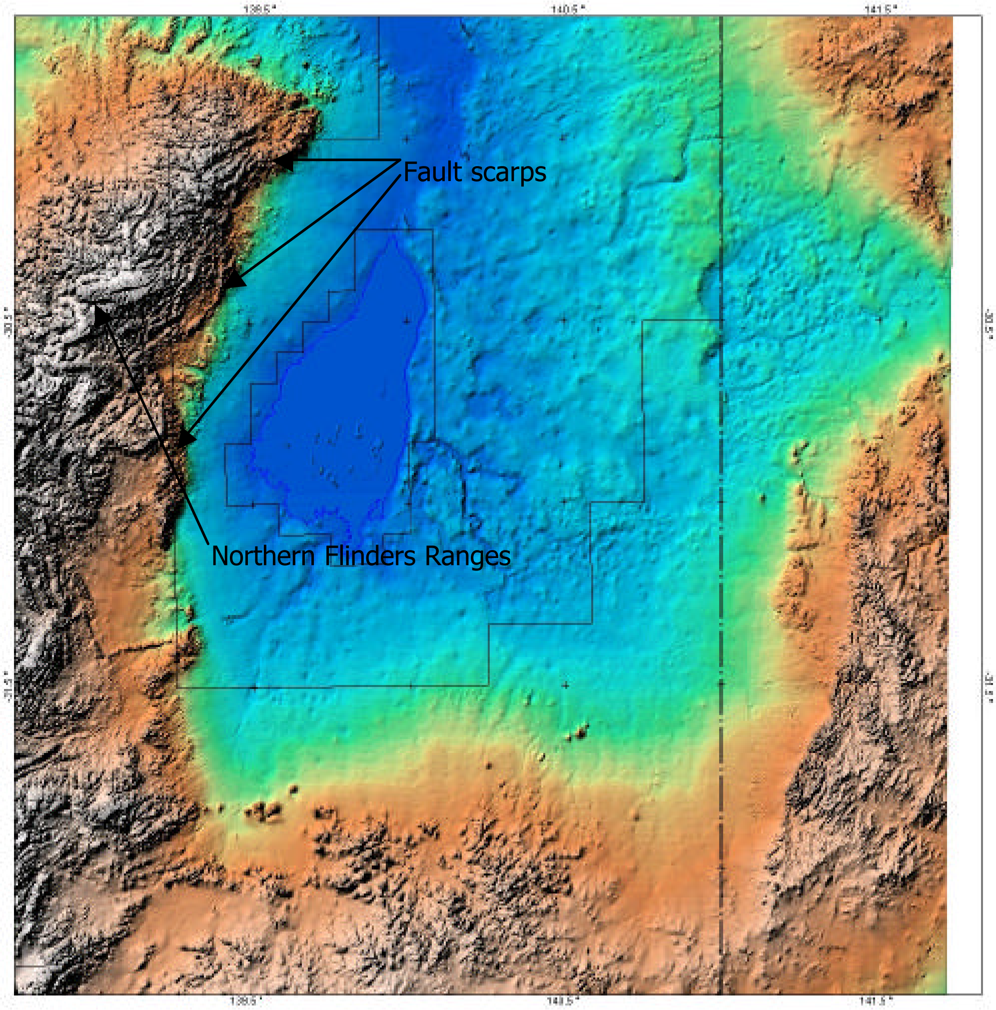
HSI image of Bouguer Gravity

Gravity data is a very important tool for interpreting basins. It maps subtle changes in the Earth's gravitational field caused by variations in the density of the underlying rocks. Although the resolution of this dataset is low (7km spacing), it provides valuable information on the nature of the deeper parts of the crust and mantle beneath the basins. Important intra-basin structuress often have an associated gravity signature indicating that each element is related to a deep basement structure.

In order to evaluate the source of the gravity signature, the data must be calibrated with known geology and/or geophysical models. Gravity images show density contrasts within the crust and upper mantle but the source of the contrast is not unique. Thus the origin of each anomaly must be distinguished in this calibration process.

For the Arrowie Basin study, the SA state 500m stitched gravity grid was imaged in ERMapper using a HSI colour model. Note the new high resolution PIRSA gravity data in the Olary Inlier and Benagerie Ridge.

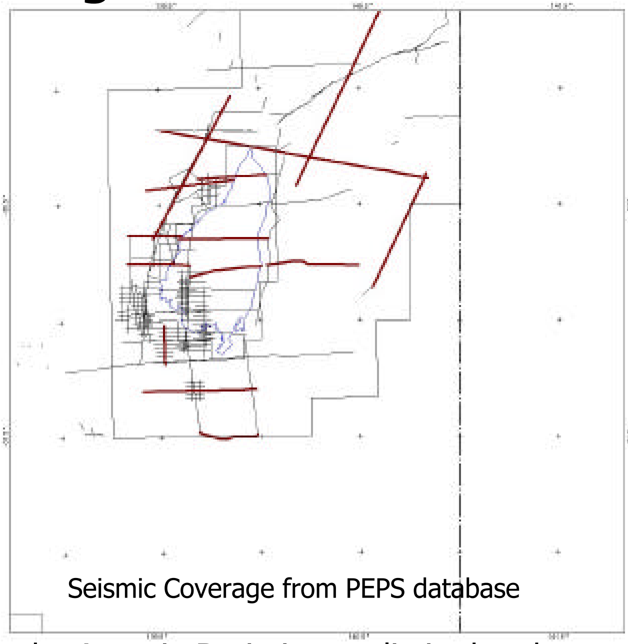
Digital Elevation Model



Digital Elevation Models (DEM's) often show the youngest structures, and any active geological structures. They are widely used for neotectonic analysis. The composition of eroding terrain controls its resistance to weathering, hence DEM's can be used to distinguish different compositional domains.

The Digital Elevation Model (DEM) for the project area shows the Tertiary topography of the Northern Flinders Ranges, defined by major faults scarps.

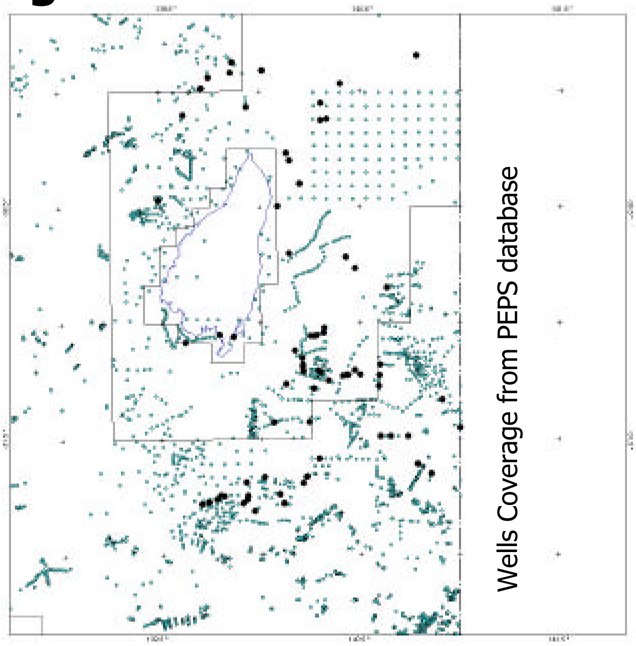
Seismic Coverage



Seismic coverage in the Arrowie Basin is very limited and generally poor quality. The top-basement unconformity is generally not clearly imaged.

In this study, limited seismic data has been used as a calibration tool for the depth to basement modeling and the structural interpretation (particularly timing of structural reactivation). Lines used are shown as bold in the above map.

Wells Coverage



Well coverage from the deeper parts of the Arrowie is very limited, with only a few basement penetrations in the shallower parts of the basin. Solid black dots represent wells used to calibrate this study.

Calibration of Potential Field Data

Calibration is a critical process in any potential field interpretation.

In order to extract as much reliable geological information as possible from potential field data, it is critical to calibrate the data. This is done initially using mapped geology or basement well intersections combined with rock property data (e.g. magnetic susceptibility, density). Once identified, mapped geological units can be traced offshore or under sedimentary cover. Knowing the particular geological units provides information about basement composition and allows for much better constrained depth models from magnetic data.

Away from outcrop control, seismic data are integrated (when available) to further constrain the development of a geological model. Basement penetration by wells and deep seismic data are particularly useful in constraining depth-to-basement estimates from the aeromagnetic data.

Why Basement?

The basement of any basin provides the foundation onto which the sediments are deposited. The rheology and mechanical behaviour of the basement controls the geometry and rate of subsidence of the evolving basin. Basement rheology and mechanical behaviour are determined by its composition and structural fabric. Thus it is important to understand basement evolution prior to basin development.

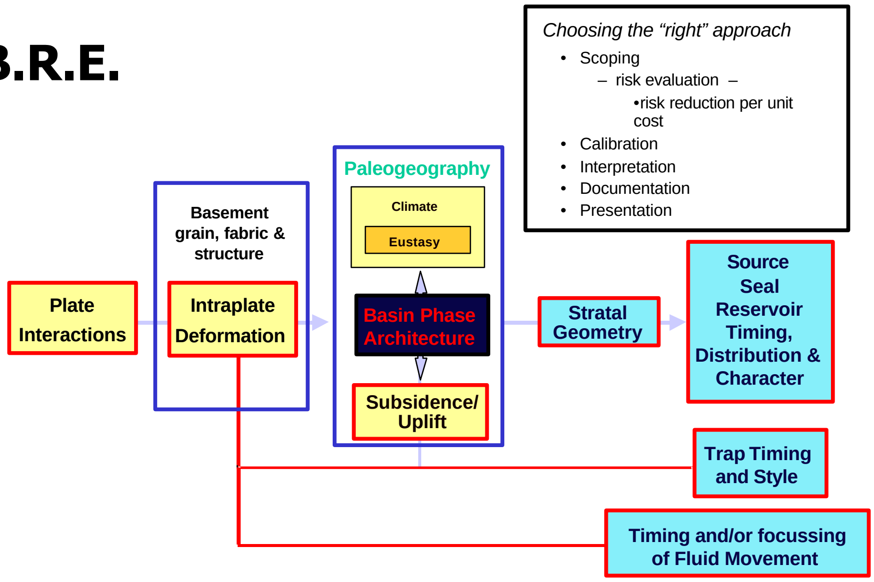
Understanding basement structures allows models to be developed that can predict which structures will reactivate, and how they will move under an applied stress. Using plate tectonic reconstructions, the far-field stress state during past events can be estimated and a kinematic reconstruction produced for each event. Basin sediments deform in response to movements in the basement and to gravity. Knowing how and when the basement moves provides a basis for predicting the most likely locations of depocentres and structures in the sediments.

Hence basement influences:

- basin phase architecture
- source-rock quality and distribution
- heat flow
- migration focusing, pathways and timing
- trap timing, distribution, type, integrity & size
- sediment supply and stratal geometry
- reservoir, seal quality & distribution

Systematic Approach to Basin Resource Evaluation

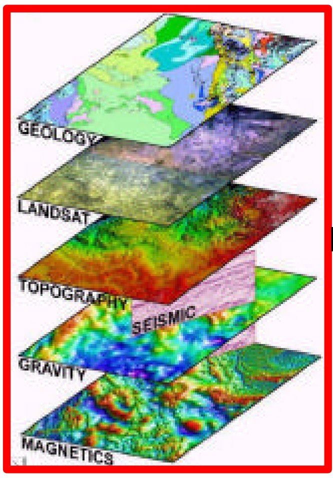
S.A.B.R.E.



The methodology used to develop a comprehensive structural model relies on the integration of all available geological information. Individual datasets alone can be ambiguous and when isolated often produce poorly constrained interpretations. Through integration, the model can be tightly constrained. Integration provides the means with which to calibrate each dataset to the other.

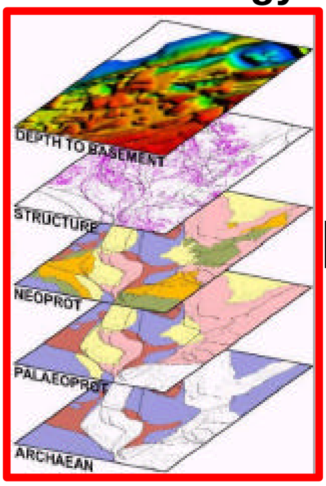
Basement Character and Petroleum Systems

Old Data



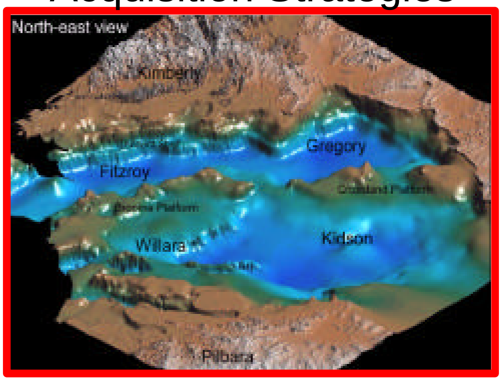
New Technology

Good Geology



Bottom-up

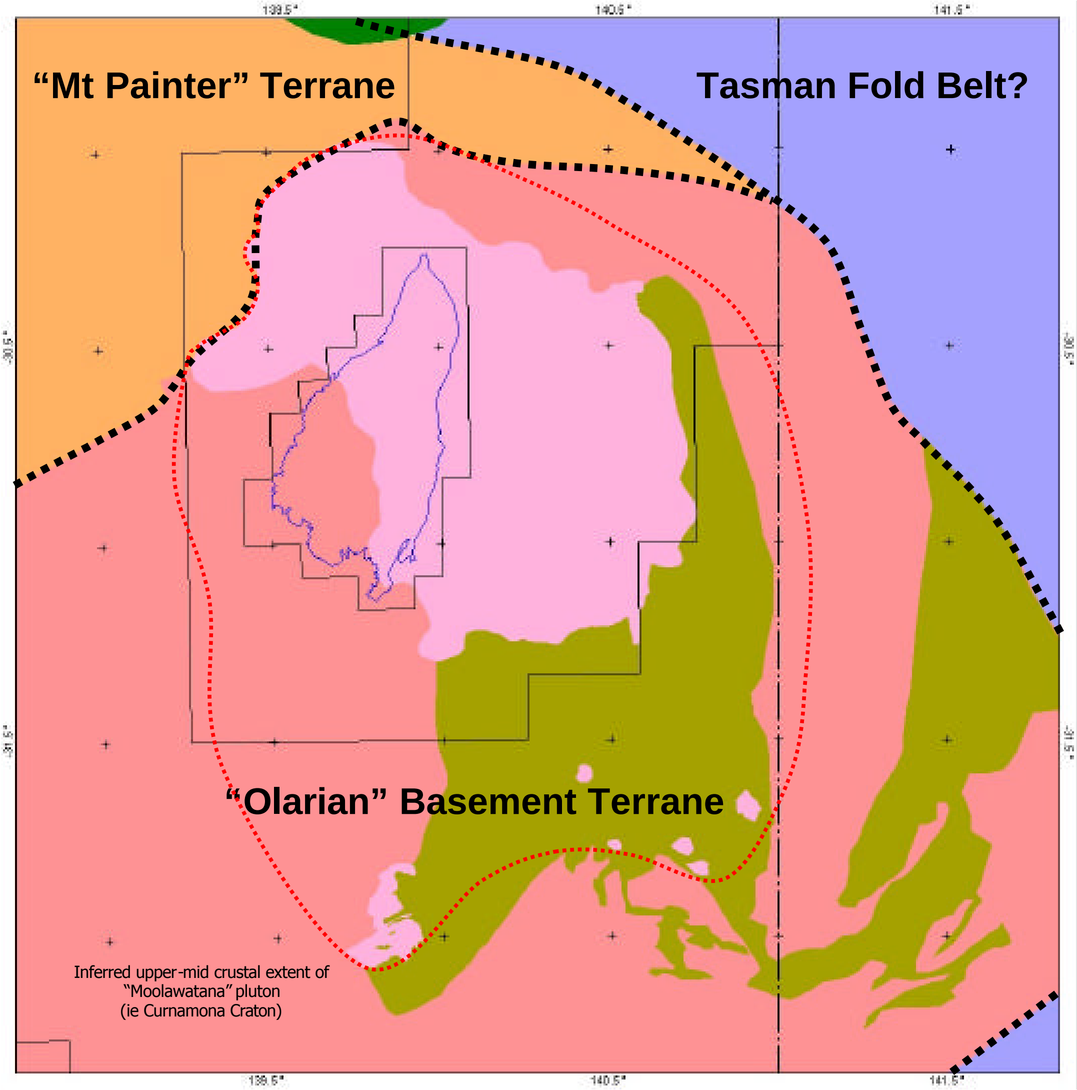
New Exploration and Acquisition Strategies



New Views in Old Basins

Efficient and Effective Exploration

Basement Terranes



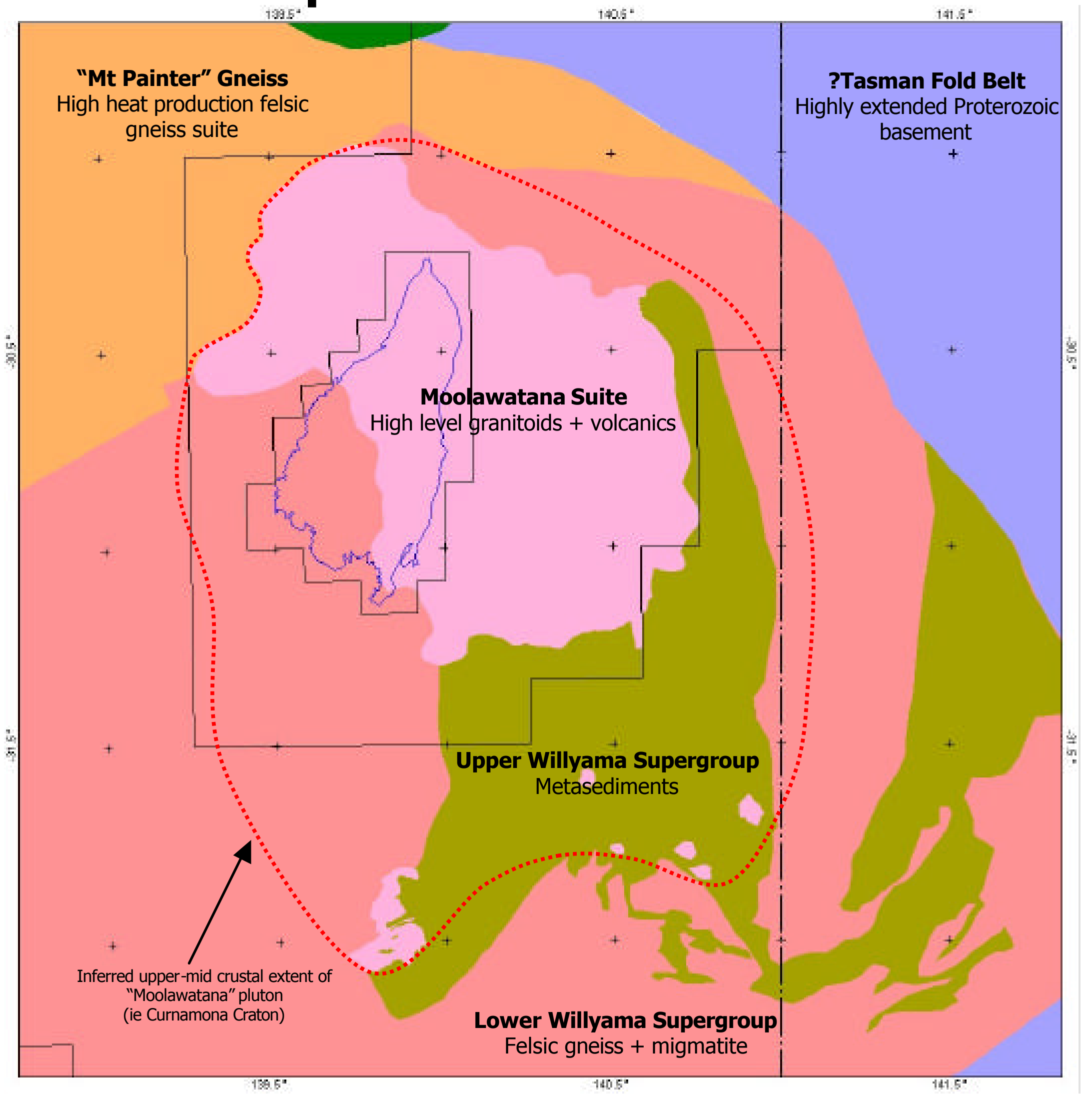
Three Paleo-Mesoproterozoic basement terranes occur in the project area: the "Olarian" Basement Terrane, the "Mt Painter" Terrane, and the western-most parts of the Tasman Fold Belt.

The "Olarian" Basement Terrane is defined based on its Proterozoic geological history. It contains a high grade, early Paleoproterozoic felsic gneiss suite (the Lower Broken Hill Group) unconformably overlain by a Paleoproterozoic metasedimentary sequence (the Upper Broken Hill Group). The entire Broken Hill Group was extensively deformed and variably metamorphosed during the ~1700-1600Ma Olarian Orogeny. It has been intruded by anorogenic, Mesoproterozoic, high level granitoids and felsic volcanics of the Moolawatana Suite. Importantly, Neoproterozoic-Cambrian basin evolution (and the resultant Curnamona "Craton") has been contolled by structures and compositional domains within the Olarian Terrane (principally the Moolawatana Pluton whose below-surface extent defines the Curnamona Craton). This study is the first time this pluton has been recognised.

The "Mt Painter" Terrane contains very high heat-producing Mesoproterozoic gneisses which are currently exposed in the Mt Painter Inlier. Heat production has been sufficient to metamorphose overlying Neoproterozoic sediments to upper amphibolite facies, and cause large-scale diapirism of lower Adelaidean carbonates. This basement terrane is rheologically "soft" due to its high heat flow hence has been multiply deformed since the Mesoproterozoic.

(cont'd overleaf)

Basement Composition



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The Tasman Fold Belt basement contains highly extended Proterozoic basement of unknown origin. This basement terrane probably has a significantly different composition due to the contrast in Neoproterozoic-Paleozoic extension between it and the Olarian Terrane.

The contrasts between the three basement terranes and the structures and compotisional domains within and between them were a first-order control on the evolution of the Arrowie Basin. The terrane boundaries have acted as key reactivation zones and the terranes have behaved very differently under the stresses responsible for the basin formation due to their contrasting rheology and reactive fabrics.

All 3 basement terranes, apart from the Moolawatana Pluton, have been extensively reworked during the Delamerian Orogeny. The eastern Arrowie Basin was not deformed at this time due to the underlying Moolawatana Pluton.

Basement Structure - Overview

Basement structures are key reactivation zones during basin formation. The following basement structures have been interpreted during this project:

- Faults/shear zones
- Fabric/grain/foliation
- Deep crustal fracture zones
- Transfer/accommodation zones

These structures have been interpreted using the following data sources:

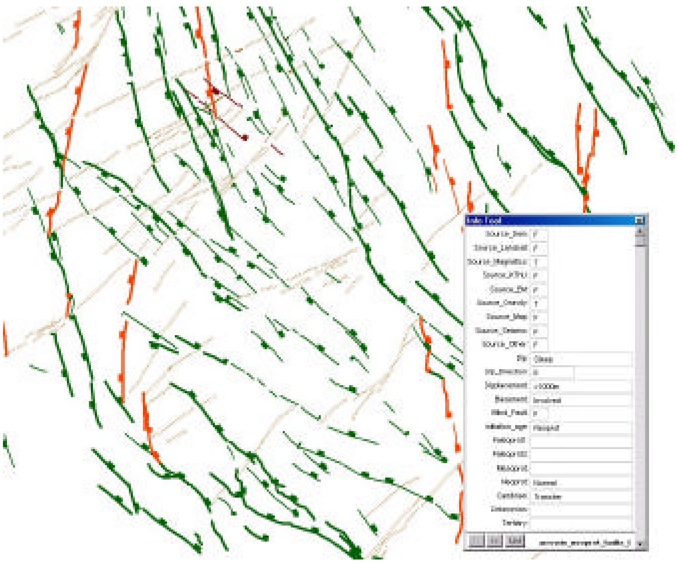
- Mapped faults
- Magnetic anomalies & discontinuities
- Gravity anomalies & discontinuities
- DEM trends & breaks
- Seismic basement-involved faults

The history of the structures is quantified using the following criteria and calibration:

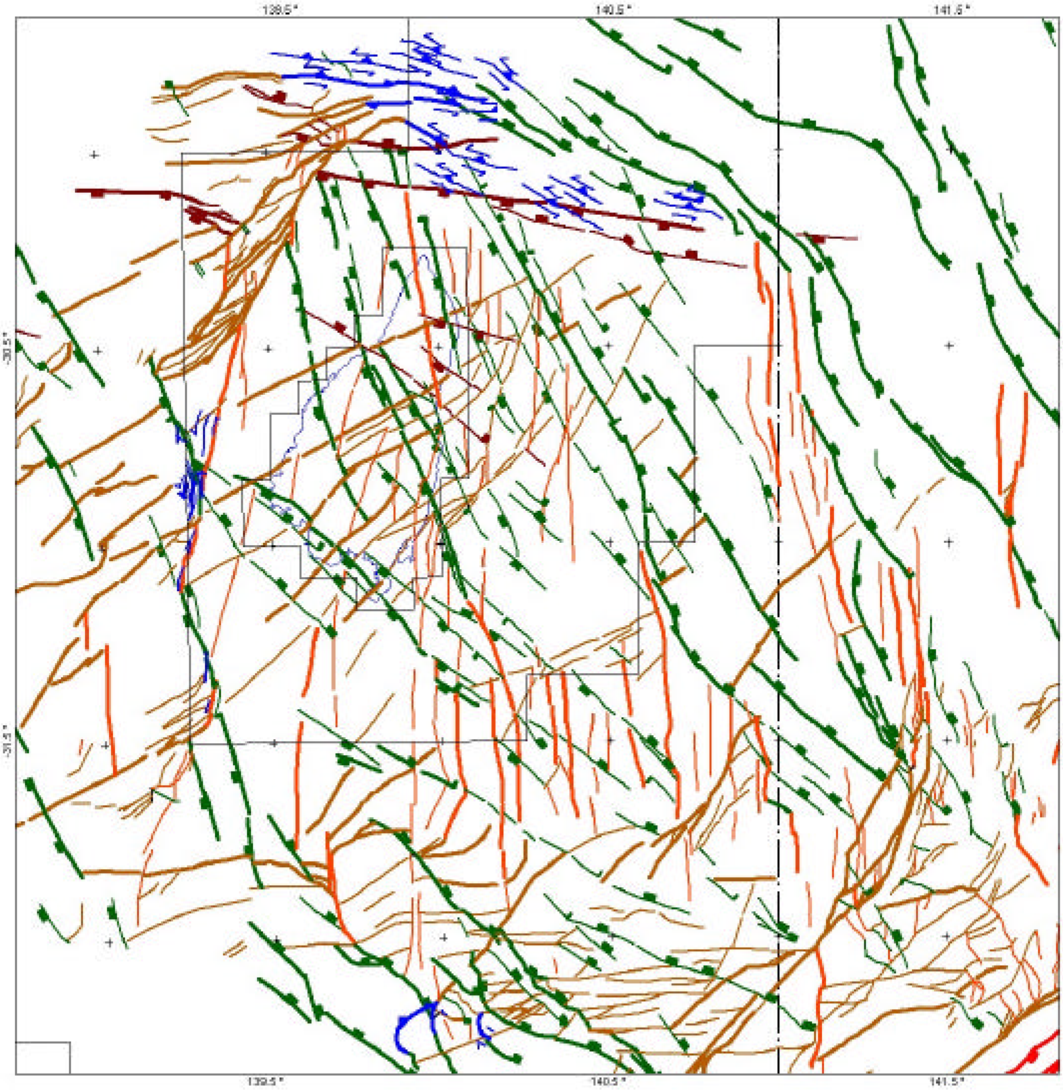
- Structural superposition
- Age of strata displaced
- Relationship to intrusive bodies
- Consistency of fault kinematics to regional paleo-stress regimes and plate movements
- Correspondence to: mapped structures, known movement history

In the GIS, the faults are all attributed by:

- Source (magnetics, gravity, DEM, map etc)
- Orientation
- Displacement
- Basement character (involved or detached)
- Dyke
- Initiation age
- Reactivation history



Basement-Involved Faults



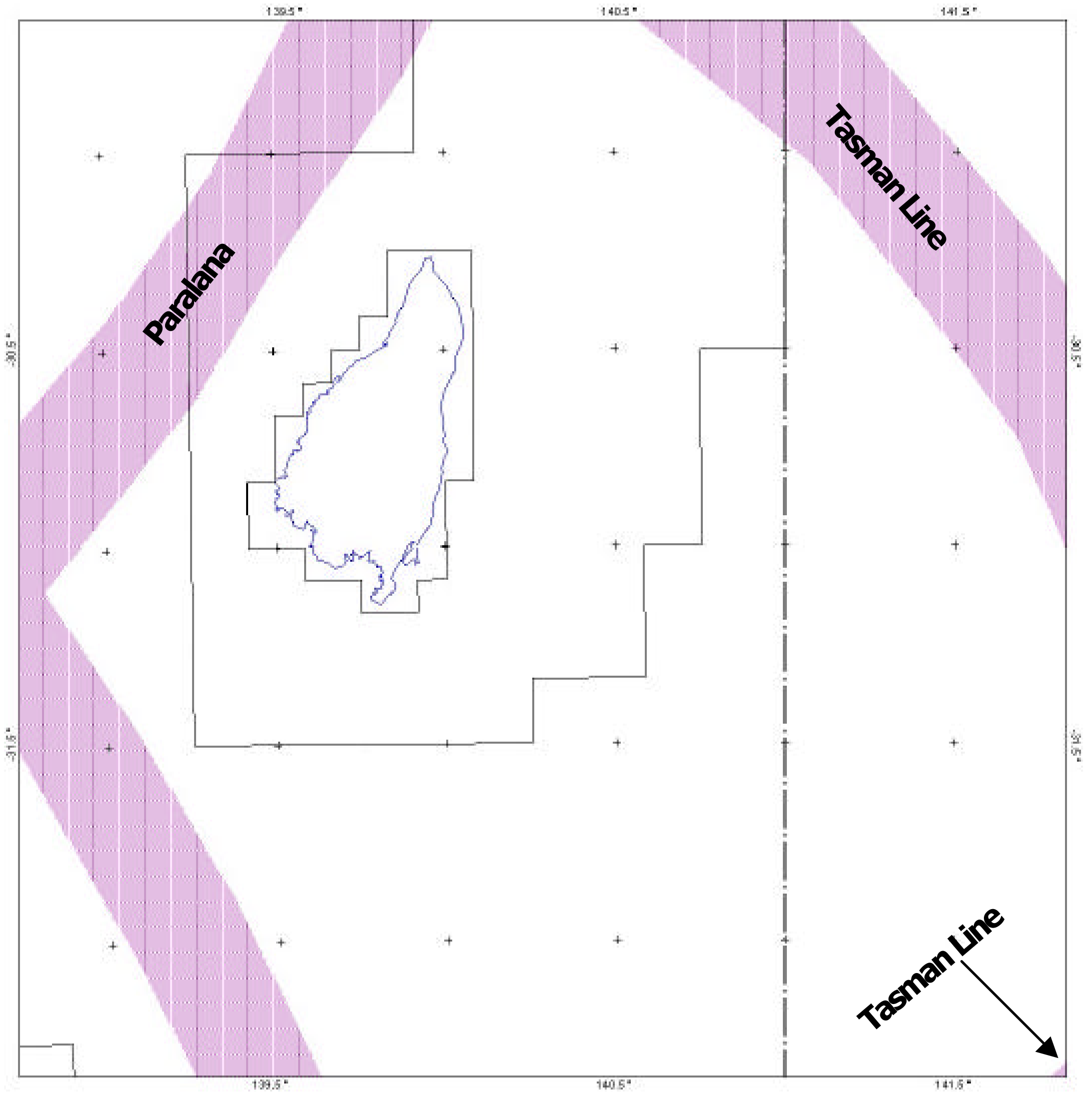
All interpreted basement-involved faults in the eastern Arrowie Basin are shown in the above map, where colour represents initiation age:

- Early Olarian
- Late Olarian
- Mesoproterozoic
- Neoproterozoic (Adelaidean)

Dashed fine lines represent the trend/fabric of basement lithologies.

Outside the Curnamona "Craton"/eastern Arrowie basement has been extensively reworked during Neoproterozoic rifting and the Delamerian Orogeny.

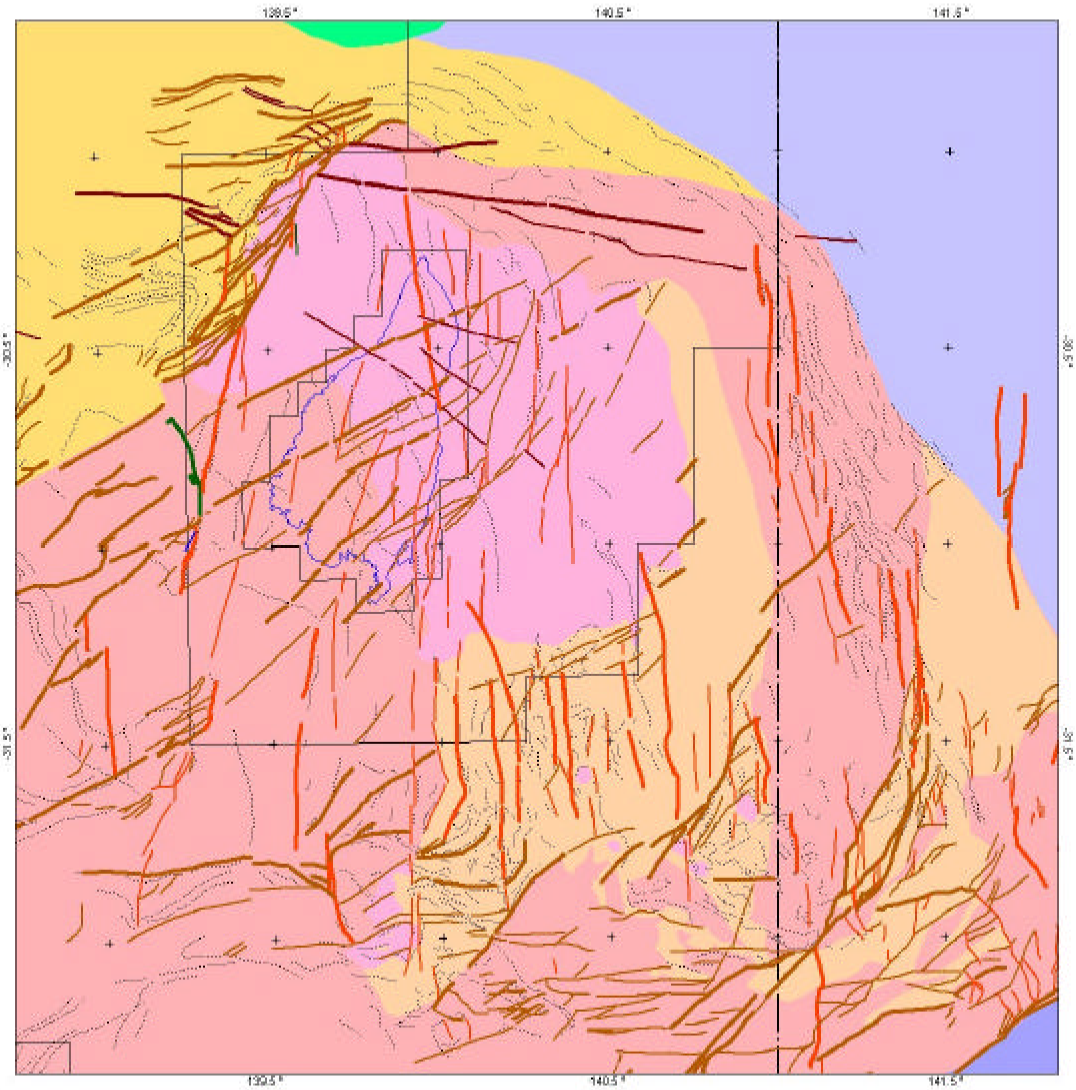
Deep Crustal Fracture Zones



Deep crustal fracture zones are seldom directly mappable in basins. They are deep seated (possibly mantle-derived), ancient zones of crustal weakness that directly or indirectly influence the subsequent development of structures and basins. They are often repeatedly reactivated. Often they coincide with terrane boundaries.

Deep crustal fracture zones in the Arrowie Basin form important boundaries between contrasting basement terranes. They were a first order control on basin evolution, especially during the Neoproterozoic. The Tasman Line is one of the most significant structures in the Australian continent. It marks the western edge of “Proterozoic” Australia, and the eastern edge of the Paleozoic Tasman Fold Belt.

Proterozoic Basement Deformation



Basement terranes surrounding the eastern Arrowie have undergone a complex Proterozoic structural history, largely during the late Paleoproterozoic Olarian Orogeny. Three main sets of basement structures have been interpreted:

(i) ~N-S trending early Olarian shear zones/compositional domain boundaries;

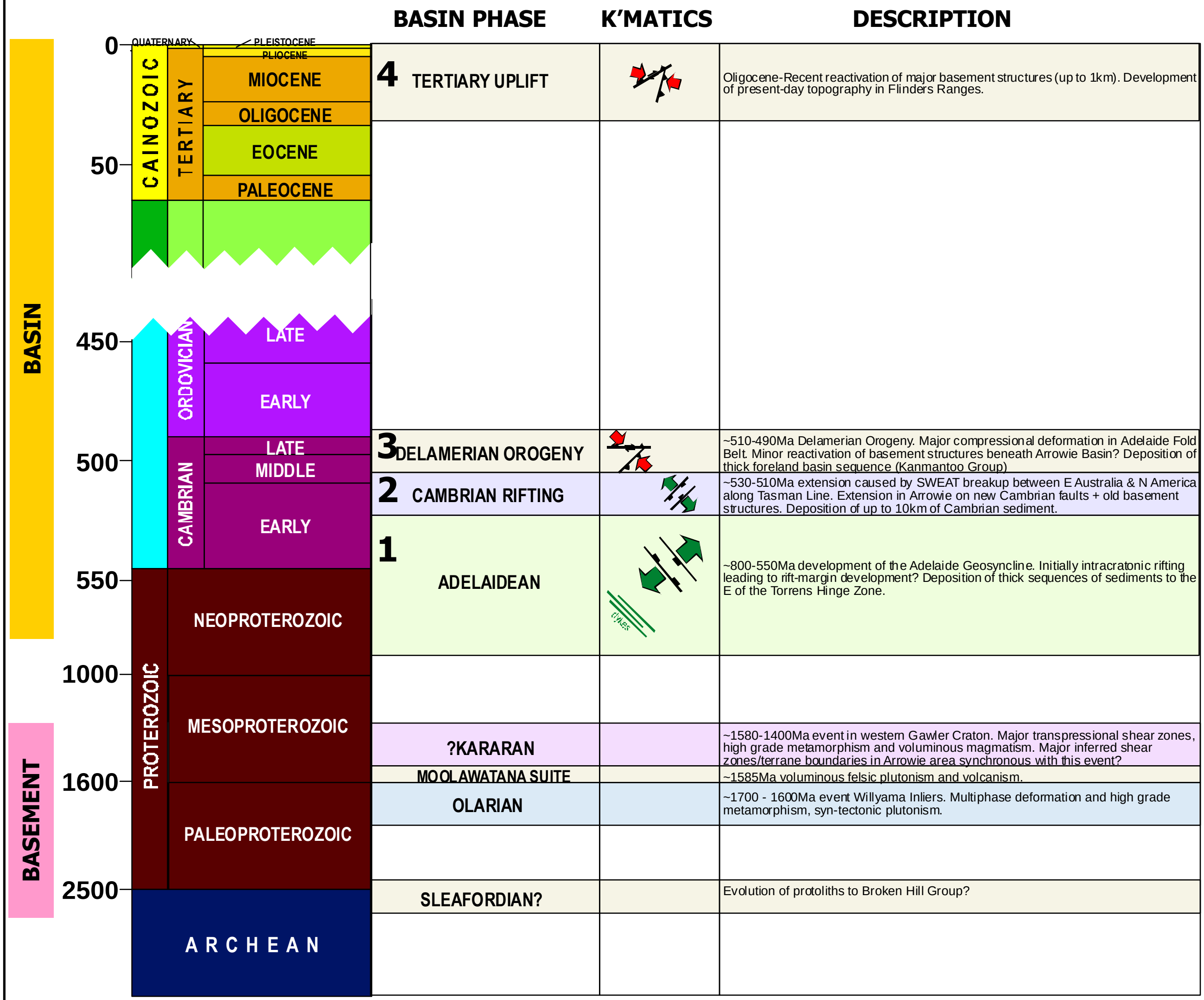
(ii) ~ENE to E-W trending late Olarian ductile structures (shear zones, fold axes), including the Olarian-Mt Painter terrane boundary;

(iii) WNW trending Mesoproterozoic faults (synchronous with Moolawatana Granite?).

Although the N-S and ENE structures pre-date the Moolawatana pluton, they have been reactivated during subsequent basin formation.

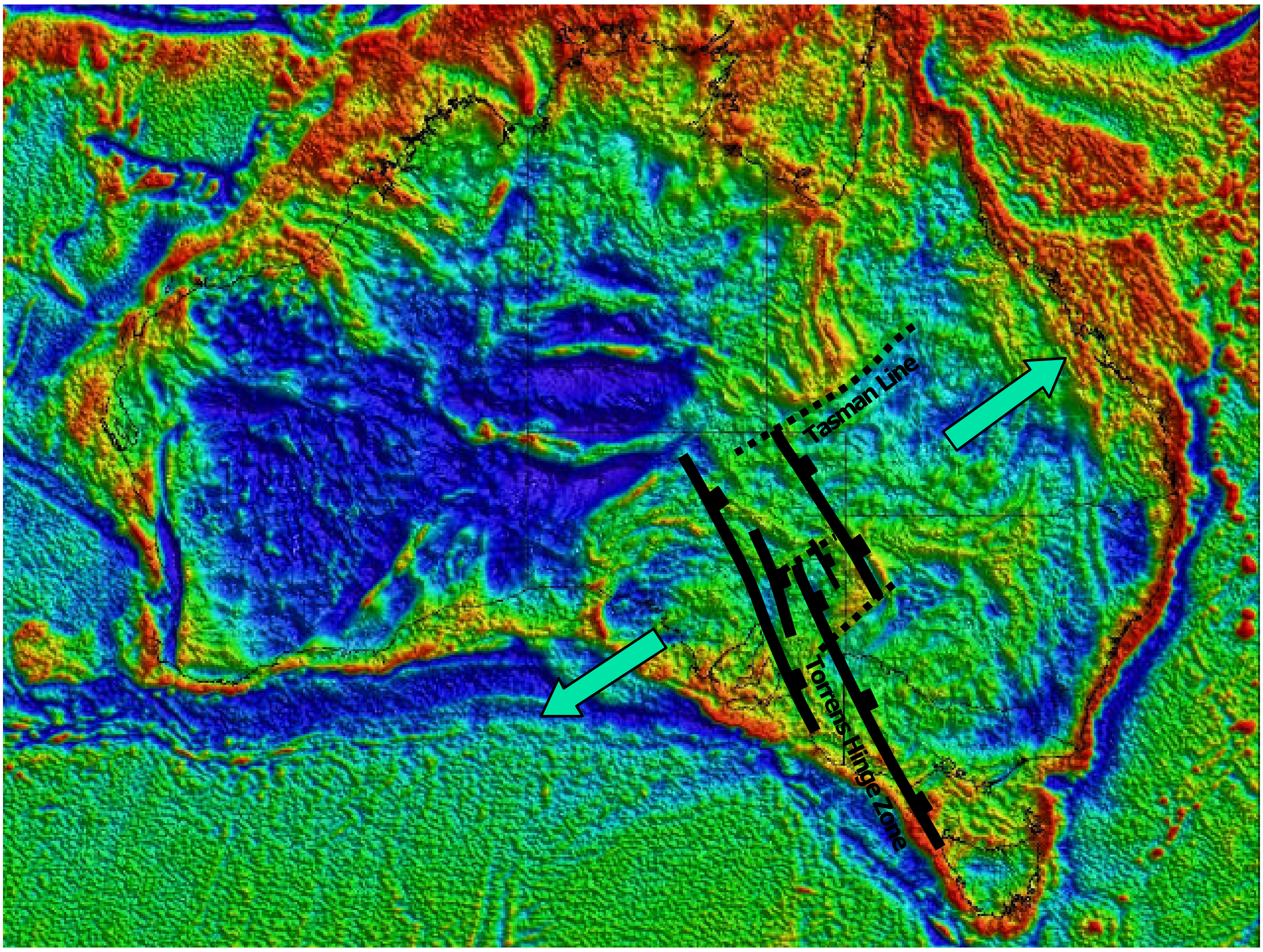
Basin Evolution

The present-day geometry of the Arrowie Basin is the result of the superposition of 4 major tectonic "events" or basin phases spanning the late Neoproterozoic to Recent. The following chart details the tectonic history of the Arrowie Basin and its basement:



Stresses operating during these basin phases caused reactivation of basement structures and reactive fabrics, as well as the development of new structures. By understanding the kinematics of each tectonic event, a predictive model for structural reactivation can be applied to the interpreted faults. When calibrated with fault history data from geological observations (e.g. seismic, maps), event maps for each basin phase can be constructed.

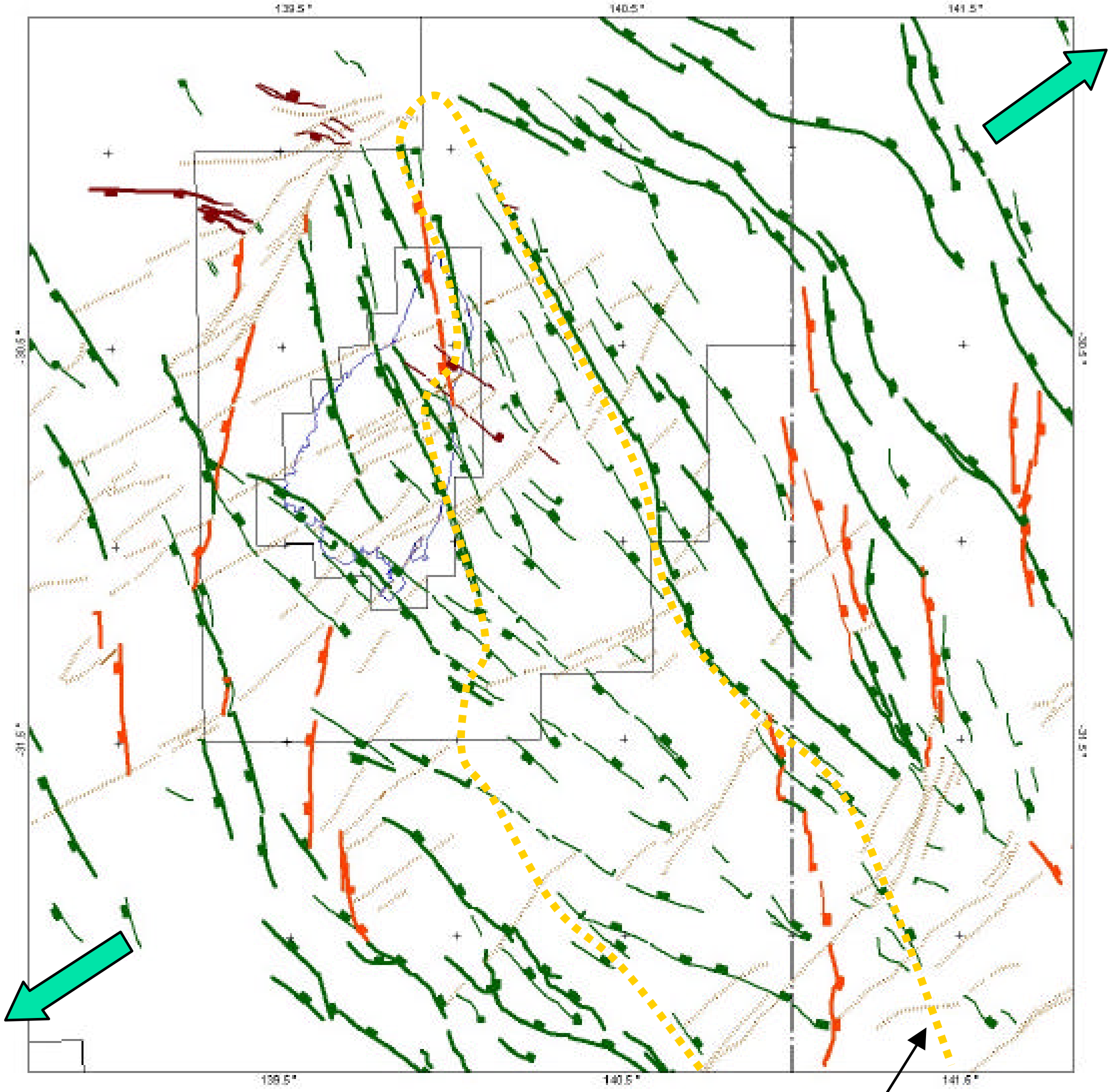
Basin Phase 1: Neoproterozoic Rifting



Intracratonic rifting between Proterozoic Australia and North America began during the Gairdner Dyke event at ~800Ma. Ongoing series of rift events through the Neoproterozoic led to the eventual SWEAT breakup in the early Cambrian. This rifting was synchronous with the flexural evolution of the Centralian Superbasin.

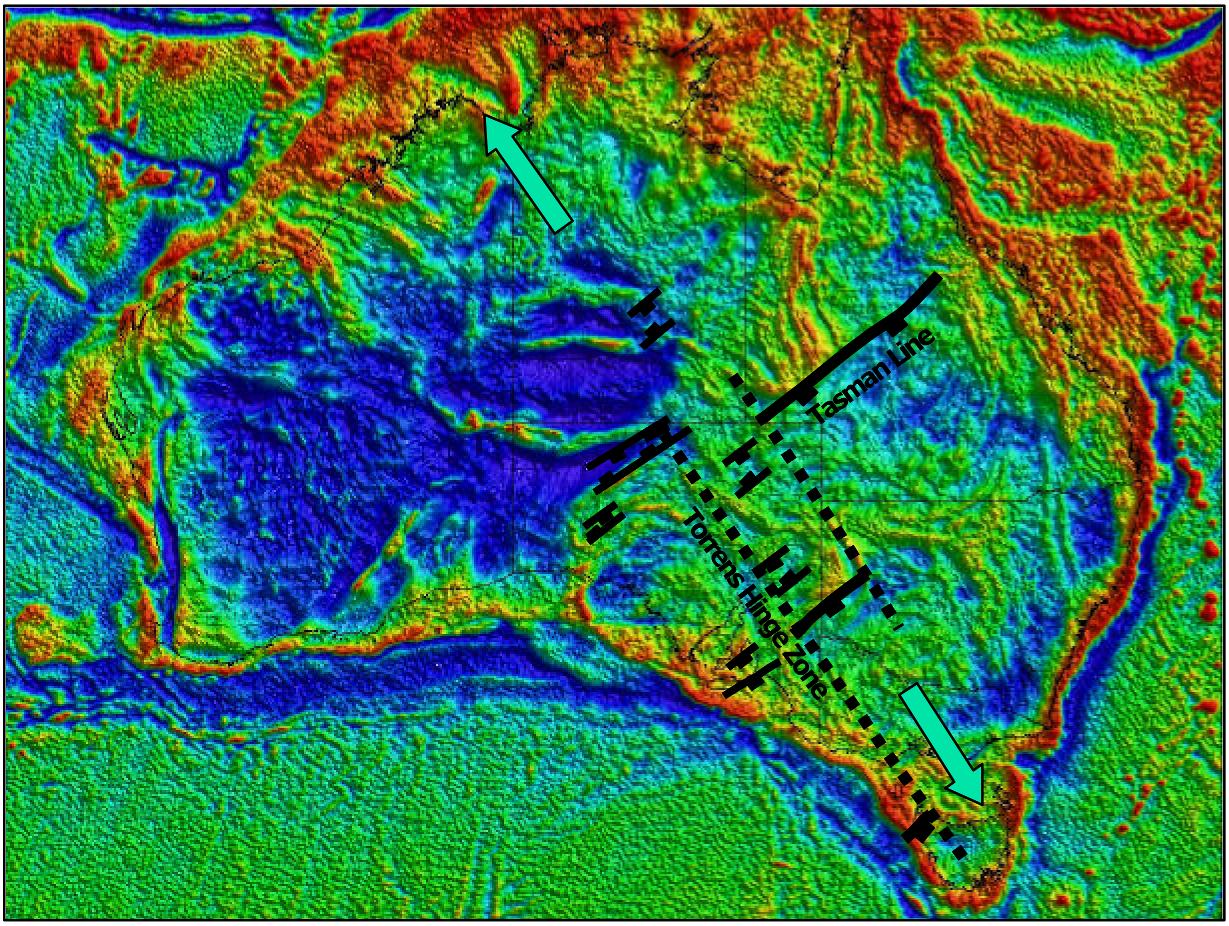
During this time the thick (up to 15km) sedimentary sequence of the Adelaide Geosyncline was deposited in ~ENE-WSW rift basins. At least 4 rift cycles have been recognised. (Preiss, 2000)

Basin Phase 1: Neoproterozoic Rifting



In the eastern Arrowie Basin, up to 4km of Neoproterozoic sediment was deposited in NNW trending graben and half graben to the east and west of the Benagerie Ridge. These graben are well defined by NNW trending normal faults and ENE transfers. The thick Neoproterozoic sequence is inferred from the difference between the Delhi Petroleum (1987) base-Cambrian map and the SEEBASE model presented here.

Basin Phase 2: Early Cambrian Extension

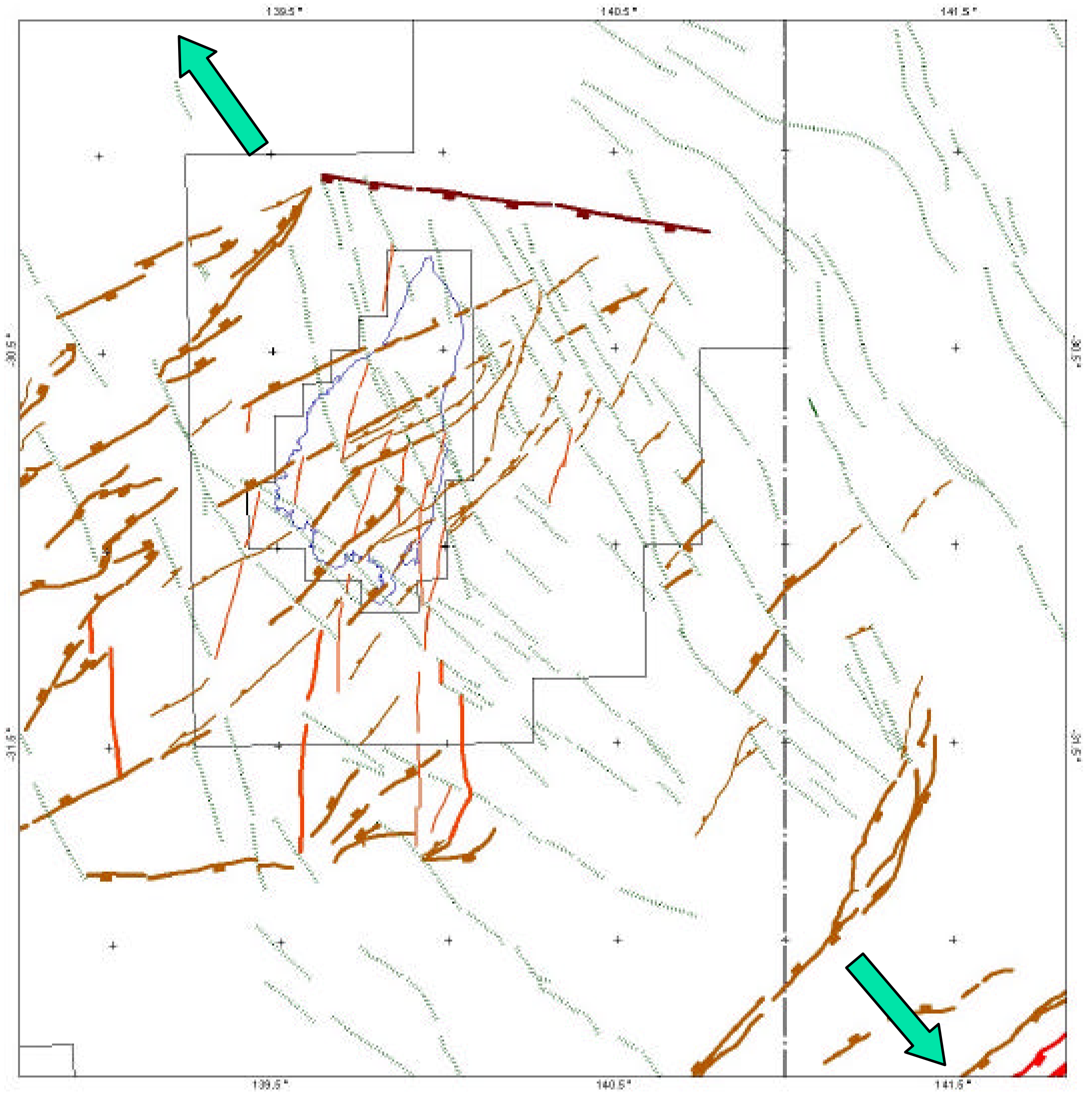


Early Cambrian extension in South Australia was caused by the final SWEAT rifting & breakup between Australia & North America along the Tasman Line. In the early Cambrian this extension was oriented ~NW-SE. Most of the extension was accommodated to the SE of the Tasman Line on structures in the present-day Tasman Fold Belt.

Limited early Cambrian intracratonic rifting occurred to the NE in the Georgina, Officer, Stansbury, Arrowie and Warburton basins. These localised early ?pull-apart Cambrian depocentres may contain good source rocks (as discovered in the Georgina Basin).

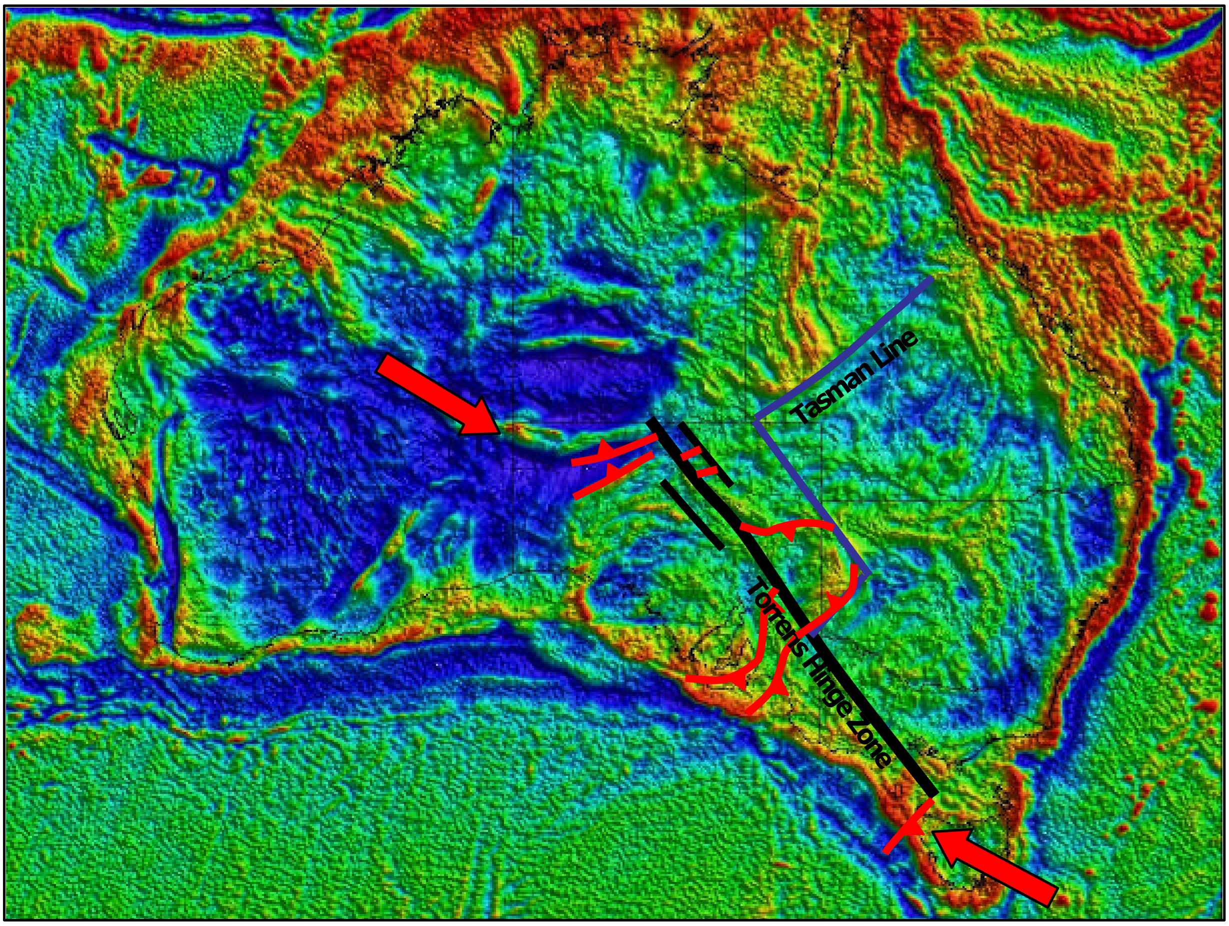
Mid-late Cambrian extension in the Lachlan Fold Belt of eastern Australia was oriented ~NNE-SSW, however no evidence for such rifting was observed in this project in South Australia.

Basin Phase 2: Early Cambrian Faults



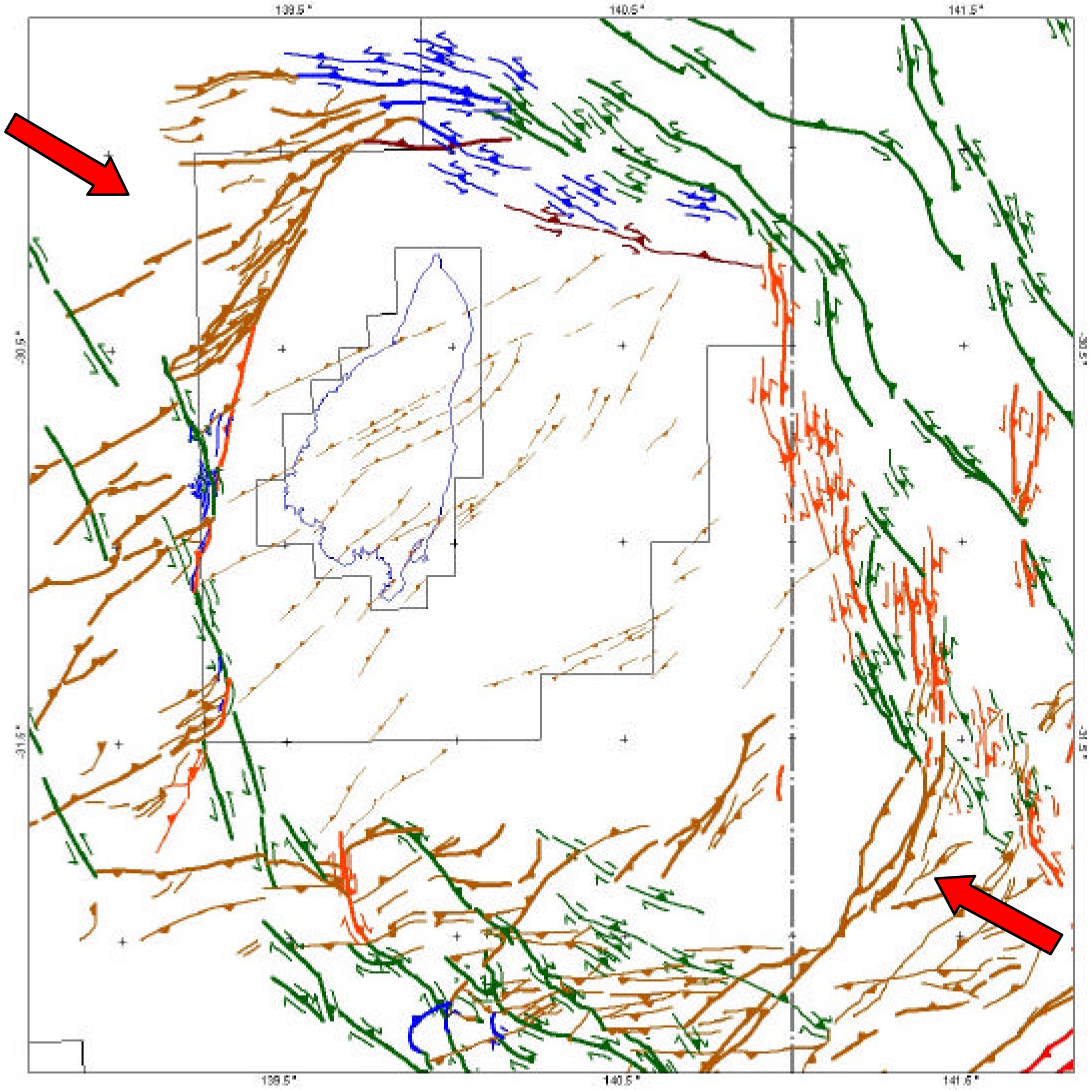
In the Arrowie Basin, NW-SE extension in the early Cambrian caused normal reactivation of old NE trending basement structures. Up to 3km of sediment was deposited in NE trending graben and half graben. NNW trending Neoproterozoic normal faults acted as transfer zones. Older Paleoproterozoic N-S structures were also reactivated during this extension.

Basin Phase 3: Delamerian Orogeny



The Delamerian Orogeny was a kinematically complex compressional event marking the terminal stages of the Gondwana-wide Pan African "event" during the time interval ~520-460Ma (late Cambrian to early Ordovician). In South Australia it caused the deformation of a series of fold-thrust belts including the Adelaide Fold Belt, Flinders Ranges and Olary-Broken Hill Province. The main phase of compression was probably oriented NNW-SSE. Sinistral transpressional movement along the Torrens Hinge Zone during the Delamerian caused popup structures to form (e.g. Mt Woods Inlier).

Basin Phase 3: Delamerian Orogeny

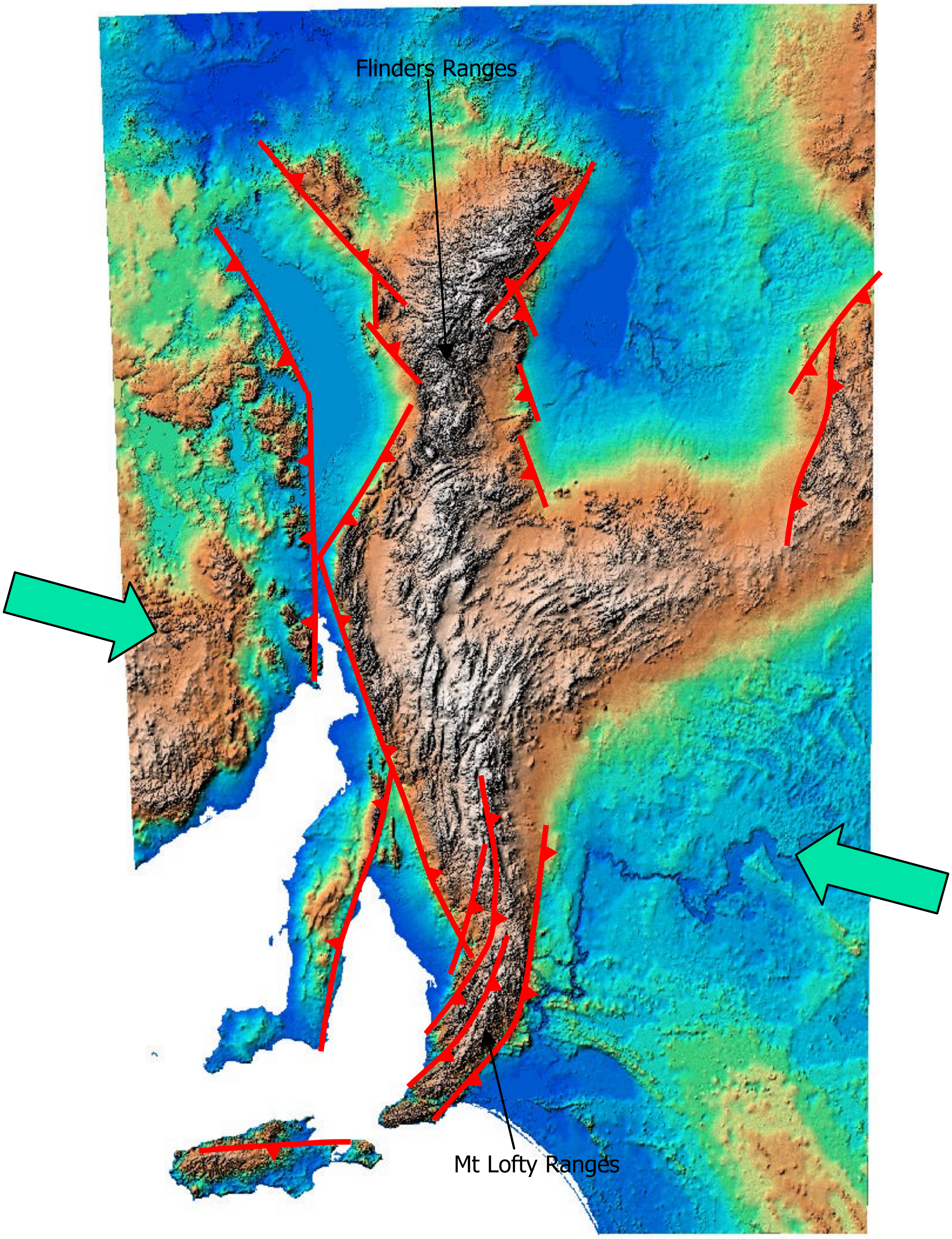


Extensive, kinematically complex deformation occurred in Delamerian mobile belts surrounding the eastern Arrowie Basin. Internally the eastern Arrowie only underwent very minor deformation via inversion of some Cambrian normal faults (potentially an important trap-forming event). In the absence of significant Delamerian deformation in this crustal block, it has been termed the "Curnamona Craton". The inferred reason for the lack of deformation is the presence of a large, rheologically strong, Mesoproterozoic, upper crustal pluton (the Moolawatana Pluton).

Foreland flexure has occurred in eastern Arrowie due to the loading of the Delamerian mobile belts. A thin sequence of foreland basin sediments (Kanmantoo Group equivalent) has been deposited.

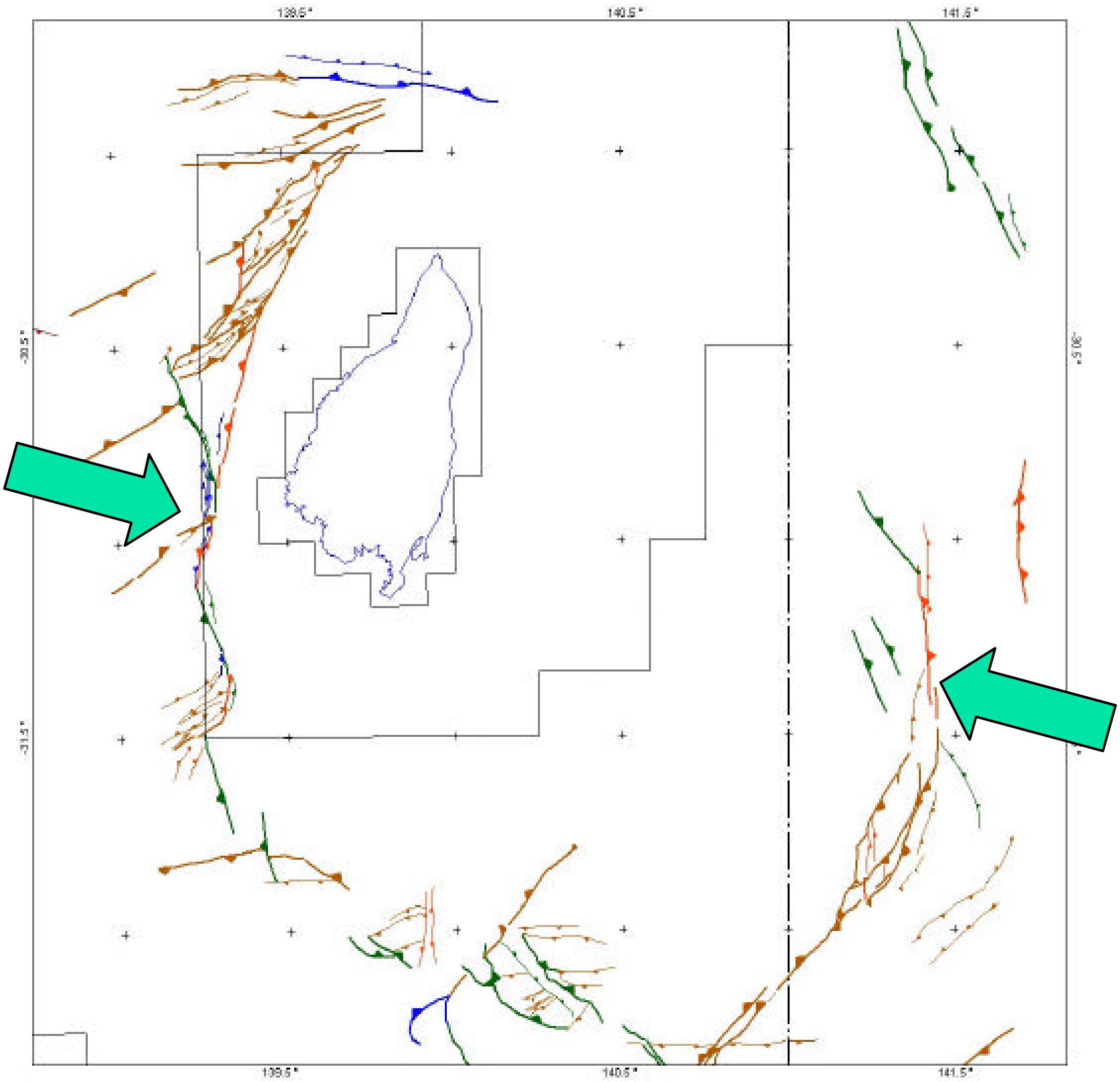
In the Adelaide Fold Belt, early Cambrian Arrowie Basin sediments were folded and faulted during the Delamerian.

Basin Phase 4: Tertiary Uplift



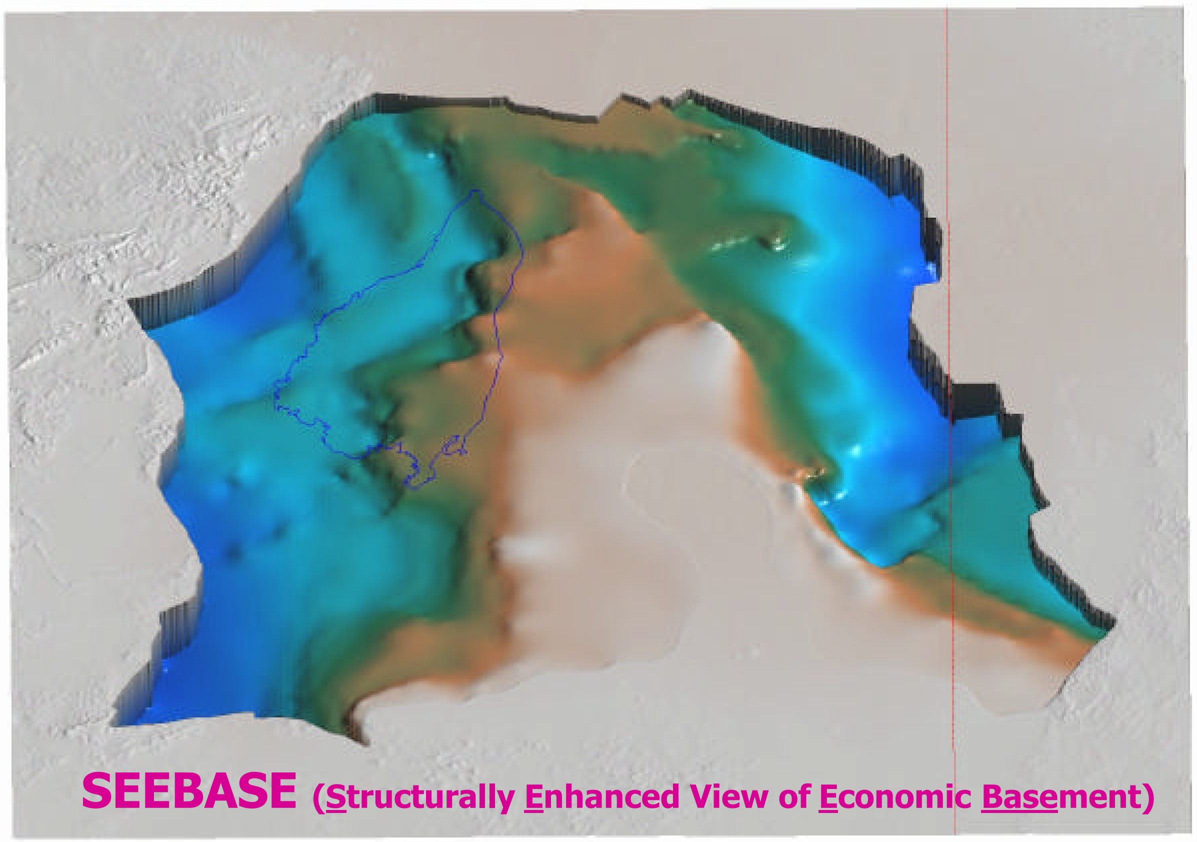
During the Miocene-Recent, ~ENE directed intraplate stresses have reactivated "weak" basement structures in the Adelaide Fold Belt. This compression led to uplift which formed the present-day topography of the Mt Lofty and Flinders Ranges. Uplift continues today, as evidenced by recent seismicity. Up to 1km of uplift has occurred on major structures.

Basin Phase 4: Tertiary Uplift Faults



Tertiary compression (Miocene to Recent) has caused reactivation of major faults surrounding the eastern Arrowie Basin, most notably in the northern Flinders Ranges. This uplift has caused minor foreland flexure in the eastern Arrowie/Curnamona Craton. Up to 800m of clastic sediment has been deposited in the resulting basin, derived from the surrounding uplands.

Depth to Basement



What is SEEBASE?

SEEBASE is much more than just another magnetic depth-to-basement model. It is the culmination of a number of calibration and integration steps:

- Integrated structural/kinematic interpretation
- Geophysical modeling
- Seismic & well calibration
- Integration of tectonic events & responses

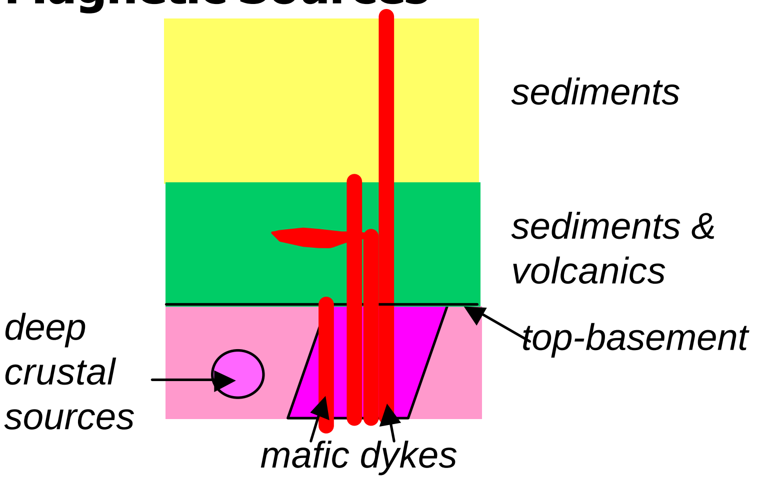
SEEBASE is a qualitative model of economic basement topography that is consistent with the structural evolution of the basin. SEEBASE defines basin architecture, and is a predictive model for exploration. It is a key base for understanding basin phase geometry/distribution and petroleum systems. As new data is acquired which allows more precise calibration, SEEBASE can be updated to reflect all new information.

SEEBASE provides a foundation for petroleum systems evaluation, including play element distribution (source/reservoir/seal), migration pathways, zones of structural complexity, trap distribution, trap type & integrity, paleogeography, oil vs. gas distribution etc.

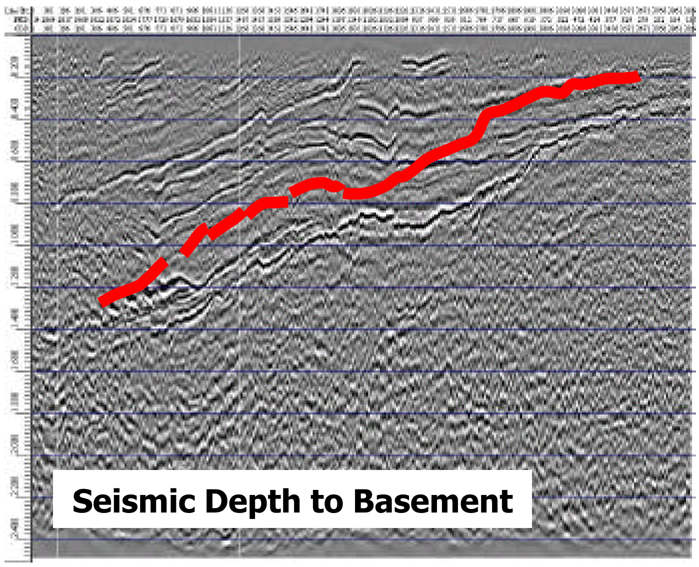
SEEBASE Methodology

1. Depth models to magnetic basement sources, obtained from profiles across selected anomalies
2. Attribution of source type to depth estimates (require top-basement sources)
3. Identification of major basement-involved faults
4. Integration of event/response history
5. Integration of gravity modeling & interp (if available)
6. Incorporation of refraction/seismic/well data (if available)
7. Intelligent contouring of "top basement" depth estimates
8. Grid construction using CPS-3
9. 2D and 3D image processing in ERMapper

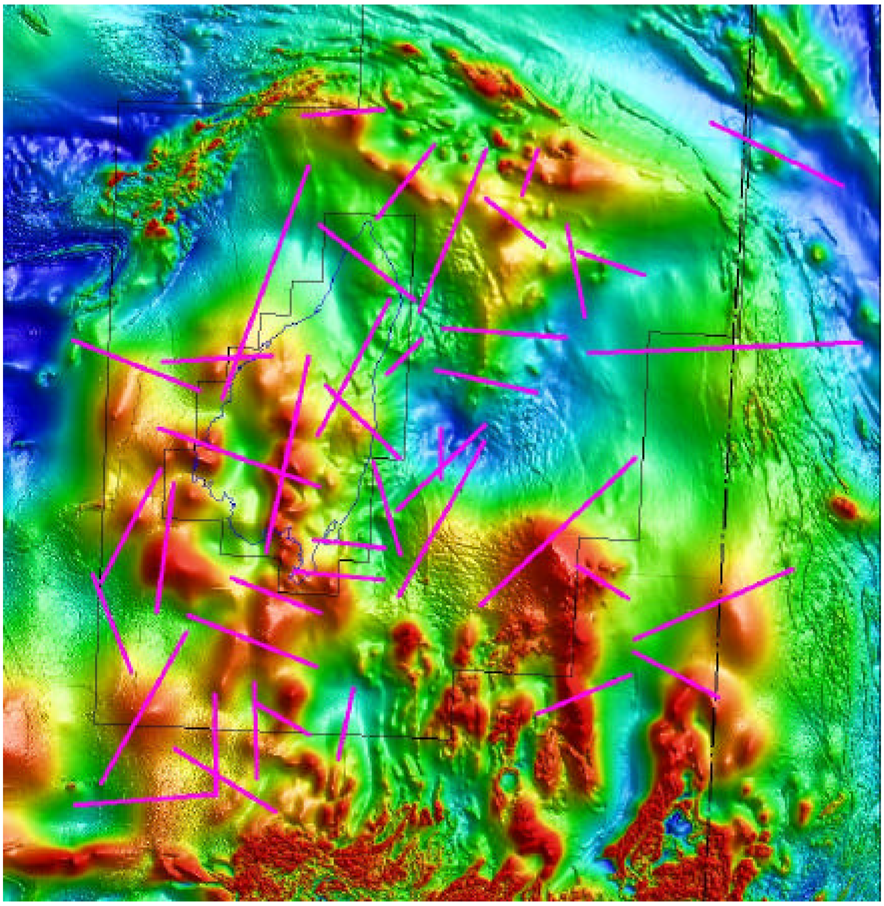
Magnetic Sources



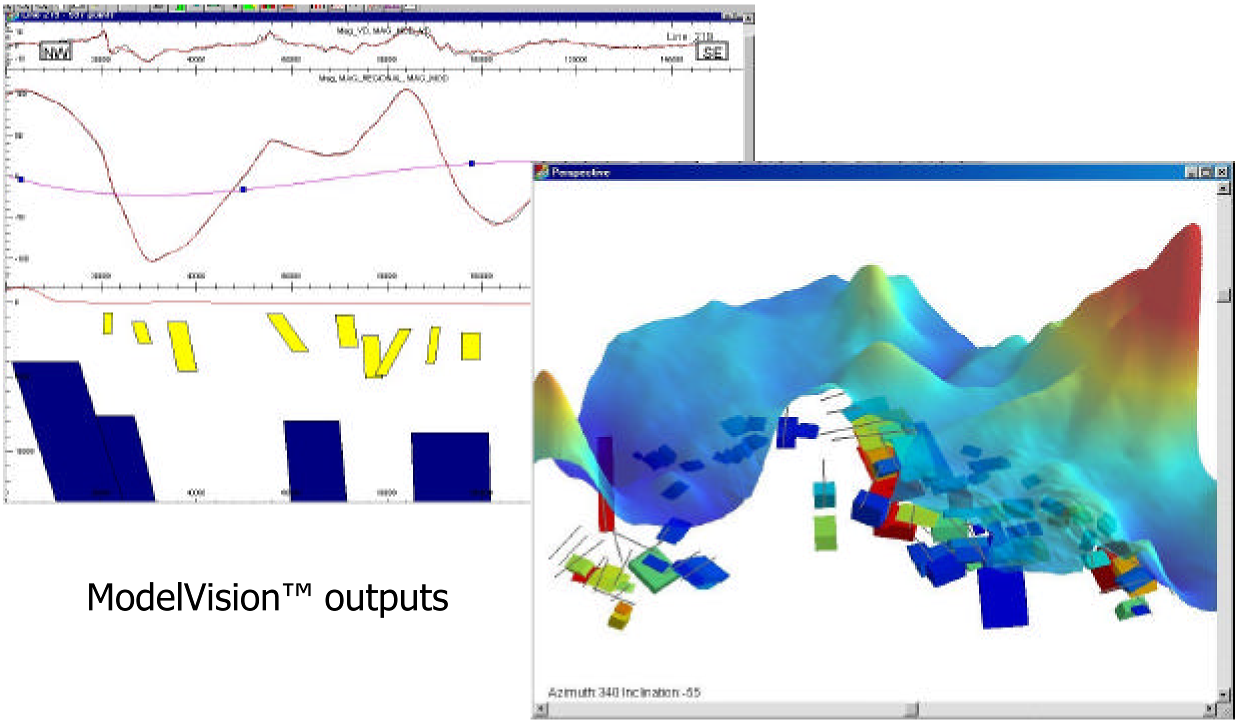
Calibration Example



Magnetic Profiles

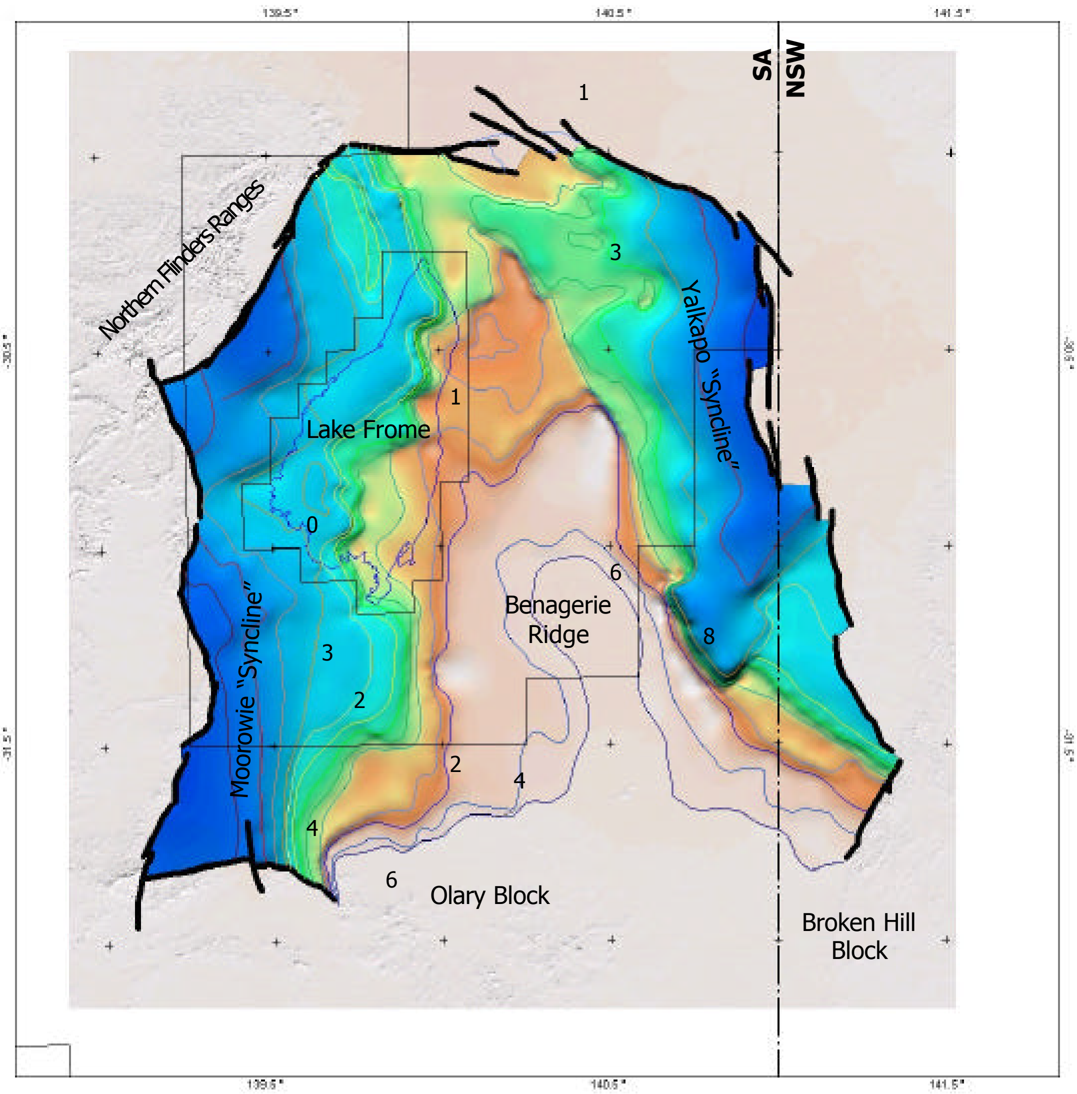


Modeled Profiles & Modeled Bodies



ModelVision™ outputs

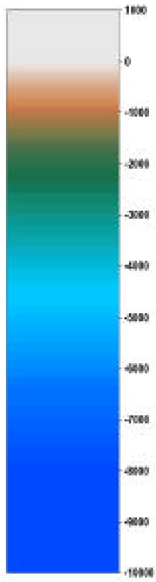
Arrowie Basin SEEBASE



Numbers represent contour values in km

Principal Basement-Involved Faults

SA Petroleum Permits



Zscale

Depth below Surface (m)

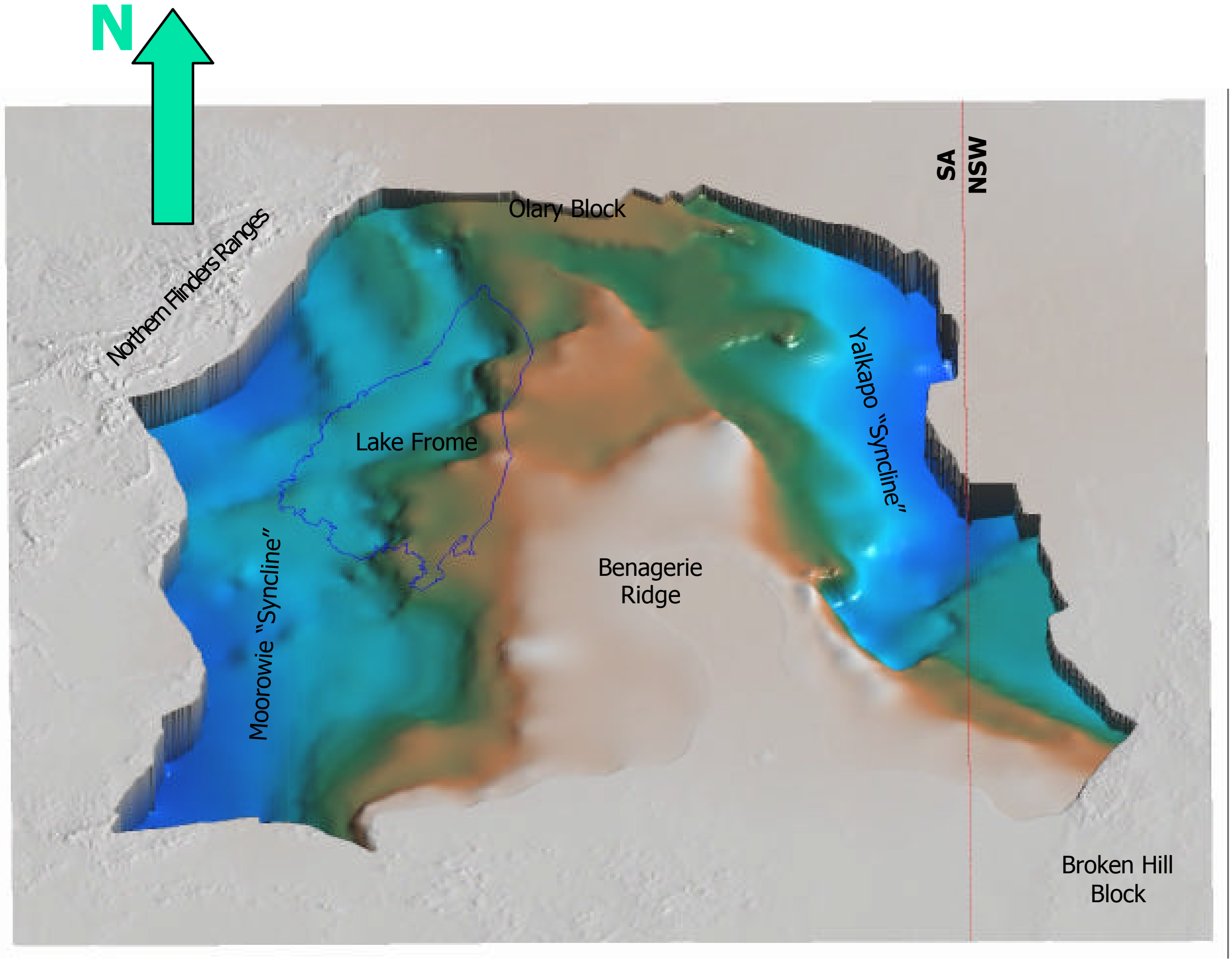
Arrowie Basin SEEBASE

Magnetic depth to basement modelling was successful in the eastern Arrowie due to good data quality. As a result, this SEEBASE dataset is probably accurate to ±10% in areas of shallower basement (<4km).

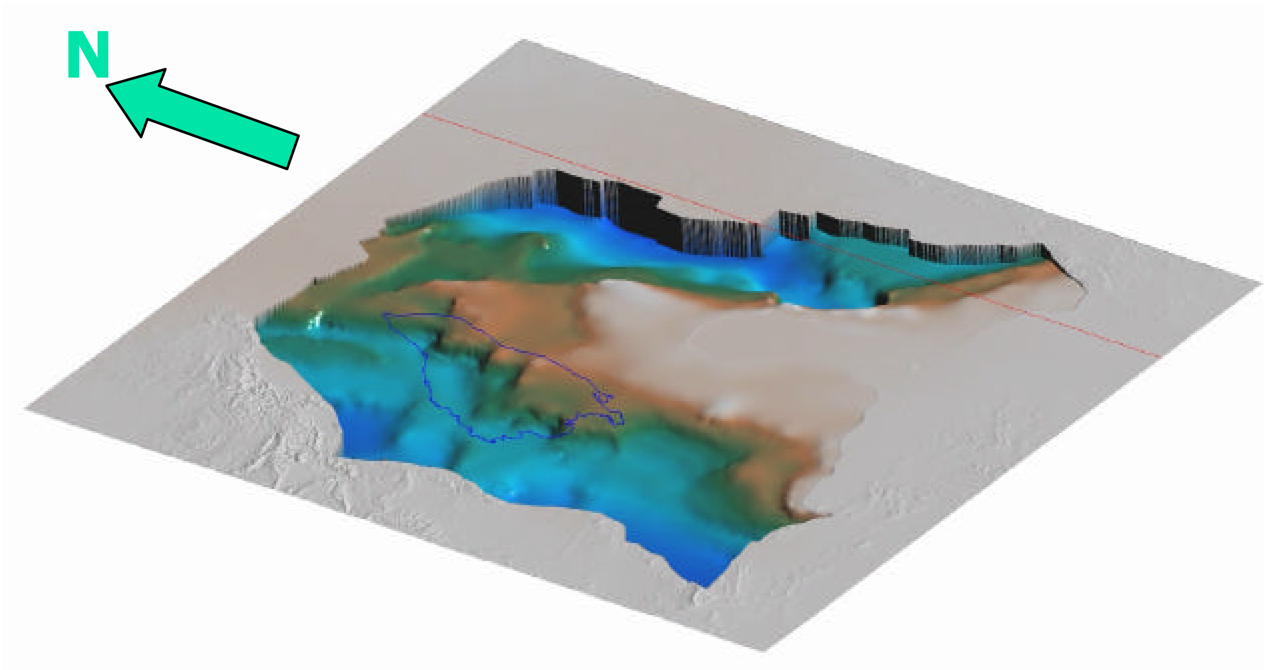
SEEBASE images of the Arrowie Basin show basin architecture, and can be used to analyse petroleum systems and basin phases.

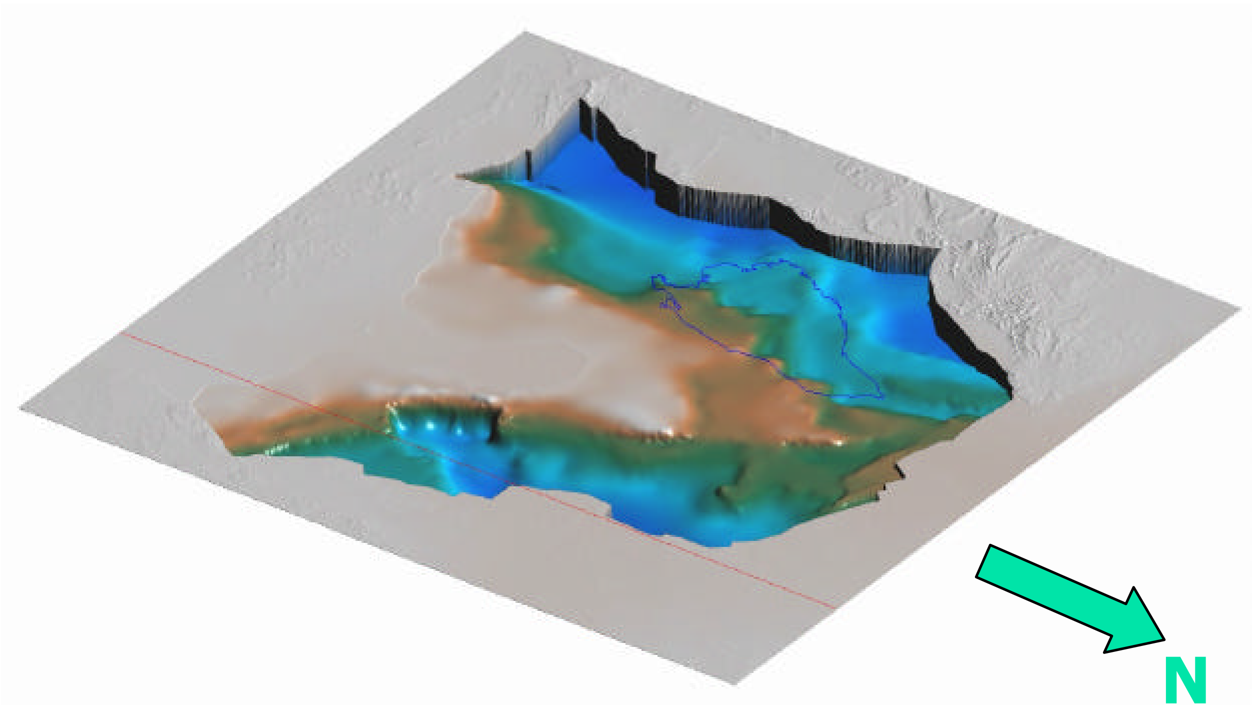
Significant features evident in the Arrowie Basin SEEBASE include:

- Central basement high (the Benagerie Ridge)
- Thick Neoproterozoic-Cambrian depocentres either side of the Benagerie Ridge (the Moorowie and Yalkapo "Synclines")
- SEEBASE depth estimates often deeper than current seismic interpretations (which just pick the lower-most horizontal reflector in poor quality data)



3D Views of Basin Architecture





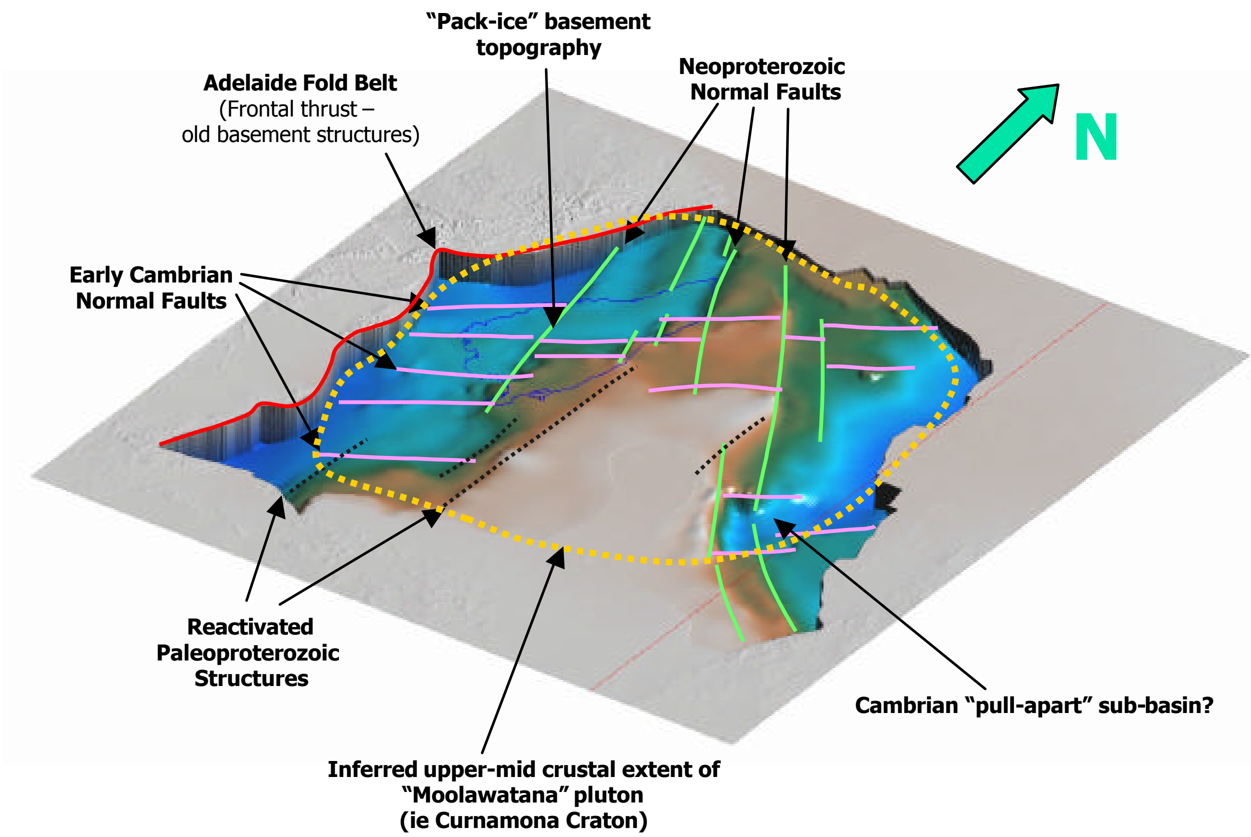
Basement Controls on Basin Architecture

This project emphasises the fact that the architecture of the Arrowie Basin is controlled by pre-existing basement structures and compositional contrasts. Key factors include:

- Rheologically strong Mid-upper crustal Moolawatana Pluton has "shielded" the eastern Arrowie from Delamerian and Tertiary deformation.
- NE and N-S trending basement structures have been reactivated during the Early Cambrian

The superposition of NE & NNW trending basin-forming faults during the Neoproterozoic and early Cambrian basin phases has resulted in a "pack ice" geometry for basement topography. Such geometries are strain-hardening since cross-cutting structures are rarely continuous, and probably further shielded the eastern Arrowie basement from Delamerian deformation.

This 3D block diagram below illustrates the influence of basement geology on basin architecture in the eastern Arrowie Basin.



References

Delhi Petroleum Pty Ltd, 1987, PEL's 5 and 6: 1984 Hogarth Seismic Survey Reports, South Australia Department of Mines and Energy, Open File Envelope 5561.

Drexel, J.F., Preiss, W.V. & Parker, A.J., 1993, The Geology of South Australia, Volume 1: The Precambrian, Mines and Energy South Australia, Bulletin 54.

Drexel, J.F. & Preiss, W.V., 1995, The Geology of South Australia, Volume 2: The Phanerozoic, Mines and Energy South Australia, Bulletin 54.

Flottmann, T. & Cockshell, C.D., 1996, Paleozoic basins of southern South Australia: new insights into their structural history from regional seismic data. Australian Journal of Earth Sciences, 43, p45-55.

Flottmann, T. & James, P., 1997, Influence of basin architecture on the style of inversion and fold-thrust belt tectonics – the southern Adelaide Fold-Thrust Belt, South Australia. Journal of Structural Geology, 19(8), p1093-1110.

Gravestock, D.I. & Hibburt, J.E., 1991, Sequence stratigraphy of the eastern Officer and Arrowie Basins: a framework for Cambrian oil search. APEA Journal, p177-190.

Haines, P.W. & Flottman, T., 1998, Delamerian Orogeny and potential foreland sedimentation: a review of age and stratigraphic constraints. Australian Journal of Earth Sciences, 45, p559-570.

James, N.P. & Gravestock, D.I., 1990, Lower Cambrian shelf and shelf margin buildups, Flinders Ranges, South Australia. Sedimentology, 37, p455-480.

Marshak, S. & Flottmann, T., 1996, Structure and origin of the Fleurieu and Nackara Arcs in the Adelaide fold-thrust belt, South Australia: salient and recess development in the Delamerian Orogen. Journal of Structural Geology, 18(7), p891-908.

Paul, E., Flottmann, T. & Sandiford, M., 1999, Structural geometry and controls on basement-involved deformation in the northern Flinders Ranges, Adelaide Fold Belt, South Australia. Australian Journal of Earth Sciences, 46, p343-354.

Preiss, W.V., 2000, The Adelaide Geosyncline of South Australia and its significance in Neoproterozoic continental reconstruction. Precambrian Research, 100, p21-63.

Struckmeyer, H.I.M. & Totterdell, J.M., 1992, Australia: Evolution of a Continent. BMR Publication, Canberra.

Veevers, J.J. (ed.), 2000, Billion Year Earth History of Australia and Neighbours in Gondwanaland. GEMOC Press, Sydney.

Youngs, B.C. & Moorcroft, E., 1982, The petroleum potential of the eastern Arrowie Basin and Frome Embayment. APEA Journal, 22, p82-101.