

## **QPSF Earth Sciences Pilot Project: Better Mineral Deposit Targeting**

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This project was initially budgeted for a 12 month duration. The project was not commenced until December 2003 rather than the original plan of October 2003 and additional funding was supplied by the pmd\*CRC to extend the project to the end of March 2005.

One of the initial goals of this project was to use a grid computing approach to access data stored by Geoscience Australia (GA) and the Geological Survey of Queensland (GSQ). Contact was made with both organisations and they indicated a willingness to participate. Unfortunately this has amounted to little as neither organisation have been able to overcome the hurdles to being able to do serve the data. Lack of availability of a suitable standard for presenting the data and security issues are the reasons given. As a result, the data is being compiled into a local database. This data includes some that is being provided by members of the pmd\*CRC that is not publicly available at this point in time.

The data that is being used to make up the database comes from a variety of sources and as a result is in a variety of formats and coordinate systems. The data formats are not always amenable to 3-D visualisation in the formats that have been presented. This has required considerable effort to re-format most of the data, establish a common coordinate system and validate the data. This work has mostly been done in ArcInfo or MapInfo, depending on the original format of the data and what needed to be done to reformat it. The “cleaned” data has then been loaded into a Fracsis database. Fracsis allows the data to be viewed in 3-D and is able to align data that have different coordinate systems (for an example see figure 1). This database is accessible by researchers at JCU.

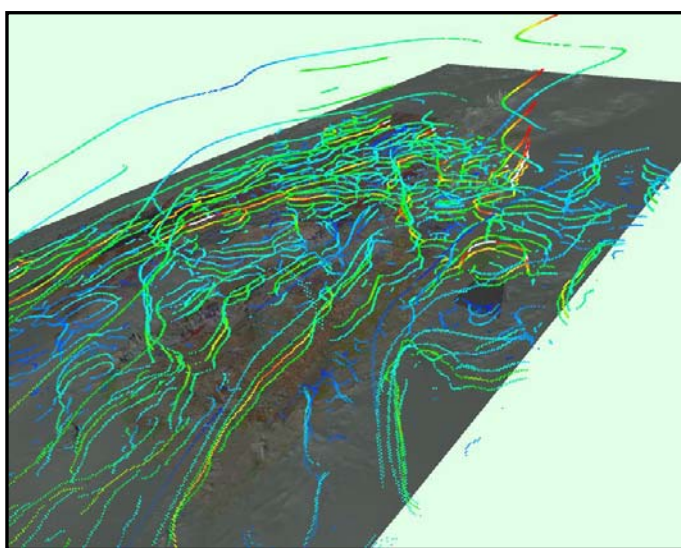


Figure 1. This figure is an image generated by Fracsis. It shows a seismic section, 1:100,000 geological maps, total magnetic intensity data, and gravity “worms”. This demonstrates how several different datatypes can be viewed simultaneously.

The main outcome of this project was the framework for a 3-D model of the Eastern Fold Belt (EFB) of the Mount Isa Inlier. A large amount of input was made by

researchers in the pnd\*CRC with over 10 researchers contributing directly to the project. Regardless of the technology being employed, this is essential as the model would be useless if it is not representative of the geology of the area. A workshop was organised for the week commencing 13 December 2004 to produce a series of cross-sections. The input of the research team was to ensure that they agree with the available data and current knowledge of the history of the Mt Isa Inlier. During the workshop the digital datasets collated during this project were used to provide a 3-D context for the construction of the geological cross-sections using Fracsis, ArcGIS, and Gocad running on hardware provided by JCU's High Performance Computing department. This provided an excellent means of intergrating the large amount of data into the task at hand.

The cross-sections generated subsequent to the workshop were imported into Gocad where they have been used to provide the framework for a 3-D model of the crustal architecture of the study area. Work is continuing within the pnd\*CRC to complete this model. A report outlining the process and geological significance of the project has been completed and circulated to members of the pad\*CRC, including the Queensland Department of Natural Resources.

In conclusion, although this project was unsuccessful in its attempts to use a grid computing approach to access data stored at various institutions within Australia it was successful in delivering a comprehensive dataset to researchers within the pnd\*CRC and the framework for a 3-D geological model. Issues regarding the format and quality of digital data stored at Geoscience Australia and QDNRM, the immature status of standards for the exchange of such data, and security issues were the main impediments to the grid computing approach.