



databases during 2005 forms part of a joint project “Development and maintenance of the Magnetic Information Consortium (MagIC)” sponsored by the Scripps Institution of Oceanography (San Diego, USA), University of Minnesota (USA), and the TSRC, and supported by NSF grant EAR-0318672.

Precambrian palaeotectonic maps of Australia, Siberia, and South China has been prepared in the framework of IGCP 440. Maps for other Rodinian building blocks are in final stages of preparation.

Aims for 2005

- Completion of the Rodinian 1:20 000 000 tectonic map (through IGCP 440).
- Preparation of the final series of paleogeographic maps and computer animations for the Precambrian and Phanerozoic.
- Further development of the global palaeomagnetic databases in their visual forms.

Outcomes: TSRC Publications #271, 294, 295, 310. Four presentations at international conferences in 2004.

Participants: Drs S.A. Pisarevsky, Z.X. Li, B. De Waele, M.T.D. Wingate, A. Collins, P. Cawood, D.A.D. Evans, (TSRC), compilers of the Rodinia map (IGCP 440) along with major players of other relevant IGCP projects.

Project 5.2: Rodinia Assembly and Dispersal Maps (incorporating IGCP 440: Rodinia Assembly and Breakup)

Aims:

This international geological correlation project has over 300 participants from over 40 countries. It aims to:

1. Determine the configuration of Rodinia and the sequence of events that lead to its amalgamation;
2. Determine whether the Paleoproterozoic cratons, within Rodinia, originated by break up of an older, pre-Rodinia supercontinent, or were independent fragments of continental crust;

3. Improve and enhance the understanding of the break up of Rodinia during the Neoproterozoic;
4. Allow analysis and interpretation of the distribution of Mesoproterozoic and Neoproterozoic mineral resources in a geodynamic framework.

The project will produce a series of GIS-based Rodinia geodynamic maps illustrating the formation and break up of the supercontinent Rodinia. This will help the TSRC to achieve its aims as defined in Program 5.

Progress:

IGCP 440 received a one-year extension without IGCP funding in 2004 in order for the project to finish the Rodinia map project. In May 2004, the IGCP Rodinia map committee held a workshop in Stockholm to finalise the map legend, standardise map format, and discuss possible Rodinia configurations to be used for the final Rodinia map. A successful one-day session was also held at the 32nd IGC in Florence in late August 2004, where various models were debated, and a draft Rodinia map was displayed and discussed. Seventeen oral and seventeen poster presentations on ongoing Rodinia-related research in the Americas, Africa, Antarctica, Australia, China, India, and Siberia were delivered at the session. A subsequent Rodinia map committee meeting suggested further modifications to the Rodinia configuration and map presentation.

Outcomes: A draft tectonic map for all building blocks of Rodinia, except Africa, was compiled. Due to the sad event of the illness and passing away of Professor Kampunzu in November 2004, Dr Allan Collins and Dr Bert De Waele of the TSRC took up the challenge of compiling the African maps, which was accomplished in January 2005.

In addition, a large number of contributions were made by members of IGCP 440 during the year, a selection of which is listed at the TSRC website (<http://www.tsrc.uwa.edu.au>, under IGCP 440). TSRC researchers played major roles in many of these publications.



Aims for 2005:

The final version of the Geodynamic Map of Rodinia will be published along with a special volume of Precambrian Research in 2005.

TSRC Participants: Almost all TSRC researchers and all members of IGCP 440. Professors S. Bogdanova (Sweden), H. Kampunzu (Botswana) and Dr Z.X. Li of TSRC are the current co-leaders, and Dr Sergei Pisarevsky of TSRC is the project secretary.

Project 5.3: Palaeoproterozoic-early Mesoproterozoic Time-space plot and database for Australia

Project coordinators: Peter A. Cawood, Alan Collins, Steve Reddy and Mike Wingate

Aims:

To Synthesise the late Paleoproterozoic to early Mesoproterozoic history of Australia and assess implications for mineral systems.

The project links to the following TSRC objectives and programs:

TSRC objectives: This project is relevant to the first four objectives of the centre.

TSRC programs: (Core programs 3 & 5) Pre-Rodinia supercontinents (3000 – 1300 Ma).

Project outline:

Cratonic fragments of Australia (e.g. Yilgarn, Pilbara, Gawler, and North Australia) were assembled into the Australian continent during the late Palaeoproterozoic to early Mesoproterozoic along a series of orogenic belts and subsequent basins. The geodynamic setting of Australia during this time frame is unresolved with both fixist intracratonic and mobilist plate tectonic models proposed. In addition, rocks of this age host a significant proportion of Australia's mineral wealth. Zinc deposits of this age occur in the Curnamona and Mount Isa-McArthur region (Broken Hill, Mount Isa, McArthur River,

Century and Cannington). Iron oxide copper-gold and copper-gold-uranium deposits are found in the eastern Gawler (Olympic Dam) and the eastern succession of the Mount Isa Inlier (Ernest Henry and Osborne). Gold deposits occur in the Tanami, Mount Isa and Pine Creek regions, which also host Australia's principal uranium deposits (Ranger and Nabalek). Understanding the geological evolution of Australia during this time interval is critical if the potential of this resource-rich series of rocks is to be fully realized, particularly as exploration companies increasingly move to explore beneath younger cover.

A common criticism of published tectonic models is that they appear to be based on very limited and incomplete evidence, with workers often proposing models based on data from only one of the many areas of the Australian Proterozoic. What is urgently needed is a synthesis of ALL available data on the Proterozoic in a format that is available to all university, government and industry researchers. This may encourage more soundly based models, and would be a very useful resource for exploration companies who currently must go to multiple sources to gain a perspective of prospectivity in Australian Proterozoic regions. A synthesis of the late Paleoproterozoic to early Mesoproterozoic time period will be the first part of this synthesis process.

Work Program:

TSRC will work with Geoscience Australia (GA) to coordinate a synthesis of the Palaeoproterozoic of Australia and establish a GIS database of relevant information. This will involve collaboration and consultation with State Surveys and University groups working on the Proterozoic. The project will build collaboration between major University, Government and Industry groups. The database will be made available to all interested parties.

GA's emphasis will be on the construction of time-space plots through the use of their key Oracle databases (PROVINCES, EVENTS and STRAT_NAMES). They will use their GIS facilities to define the current areal distribution of units, formations, events and terranes.

Progress/Plans/Outcomes: GA and TSRC personnel met in