IGCP Proposal:
Palaeoproterozoic Supercontinents and Global Evolution

1. Indicate the division into which the project falls * / *Indiquer la division à laquelle appartient le projet**

   1 2 3 **4** Tectonics, geophysics, structural geology

   to which the project is also related * / *à laquelle le projet se rapporte également* *

   1 2 3 4 Stratigraphy, sedimentology, palaeontoogy, fossil fuels

   1 2 **3** 4 Mineral deposits, petrology, volcanology, geochemistry

2. Short title of the project / *Titre abrégé* du projet:
   PALAEOPROTEROZOIC SUPERCONTINENTS AND GLOBAL EVOLUTION

3. Full title of the project / *Titre complet du projet*
   PALAEOPROTEROZOIC SUPERCONTINENTS AND GLOBAL EVOLUTION: A COMPLETE TECTONIC CYCLE REPRESENTING THE EVOLVING CORE, MANTLE, LITHOSPHERE, HYDROSPHERE, ATMOSPHERE, AND BIOSPHERE

4. Proposed by / *Projet proposé par*
   Dr Steven M. Reddy, Lecturer, Curtin University of Technology, Perth, Australia
   Dr Rajat Mazumder, Lecturer, Asutosh College, Kolkata, India
   Dr David A.D. Evans, Assistant Professor, Yale University, New Haven, USA

5. Mailing address, name, telephone, fax, e-mail / *Adresse, nom, téléphone, télécopier, e-mail*

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6. Scale of the project / *Echelle du projet:*

- ⇛ sub-continental/regional - sous-continentale/régionale
- ⇛ continental / *continentale*
- ⇛ inter-continental / *intercontinentale*
- ⇛ **global / *globale***

7. Brief outline of the project / *Brève description et objectifs principaux du projet*

The Palaeoproterozoic Era (2500–1600 Ma) is a critical period of Earth history in which it is thought that "modern" plate tectonic processes overtook the "plume" driven tectonism of the Archaean, the geodynamo gained in strength, atmospheric oxygen increased, glaciations engulfed the tropics, large changes in carbon cycling occurred, the planet suffered its two largest recorded bolide impacts, and eukaryotic life evolved from prokaryotic ancestors. Several lines of geological evidence suggest the existence of two successive supercontinents, Kenorland and Nuna, bracketing this globally important Palaeoproterozoic time interval. The amalgamation and dispersal of these supercontinents provides a framework that links processes of the deep Earth with those of its fluid veneer. This IGCP project seeks to generate plausible, quantitative reconstructions of these supercontinents, establish a thorough and robust tectono-stratigraphic synthesis of the Palaeoproterozoic geological record, and correlate supercontinental amalgamation or dispersal events with momentous changes in the Earth's geophysical, hydrological, atmospheric, and biological evolution.

Our project will bring together scientists from at least twenty countries, from different geological disciplines with expertise in different Palaeoproterozoic regions, and from academia, government, and industry, to develop a global view of the Earth during this critical period of planetary transition.

8. Estimated duration of the project / *Estimation de la durée du projet*
2005–2009

9. Tentative work schedule (items by year) / *Plan de travail provisoire (année par année)*

We aim for Palaeoproterozoic IGCP delegates to meet at 1-2 field trips/conferences each year. These will provide the opportunity to implement work load and integrate data/knowledge from different regions. Keynote speakers at the conference will be asked to produce review papers emphasising the 'state-of-the-science' in their respective fields. Each year, conference proceedings and field trip guides will be published. Two special volumes from the 2005 Tectonics SRC meeting in Perth and the 2008 IGC (Oslo) meetings will be produced. Participants will be asked to acknowledge support of IGCP for each paper published that pertains to the project. We aim to visit between 5-10 different areas of Palaeoproterozoic geology, ideally with pre and post-conference fieldtrips to visit both

undeformed cover and deformed and metamorphosed orogenic belts. Such an approach provides researchers with the opportunity to visit a broad variety of Palaeoproterozoic tectonic environments and assess the important aspects that each environment brings to a global understanding of this time period.

Pre-project (2004)

- Develop contact list of interested researchers.
- Seek expressions of interest for Palaeoproterozoic IGCP Project.
- Propose idea in Palaeoproterozoic Symposia at 15th AGC Hobart (Feb 2004), IGC 32 Florence (Aug 2004), GSAm Denver (Nov 2004).
- Preliminary assignment of leaders for regional and topical focus groups.
- Develop 2005 conference & field meetings possibilities.

Year 1 (2005)

- Confirm contact list of interested researchers.
- Establish project website with access to user-input email subscription list.
- Complete assignment of leaders for regional and topical focus groups and develop a realistic work load to achieve project goals by 2009. Regional leaders to coordinate correlation chart and GIS database compilation.
- Select database structure and management.
- Hold first official planning meeting "Supercontinents and Earth Evolution Symposium," Perth, 26-30 September and co-ordinate IGCP linked session within the Symposium framework. Ratify goals of IGCP project among international researchers. Discuss and confirm IGCP five-year work plan.
- September 2005: First field excursion to Palaeoproterozoic Capricorn Orogen of Western Australia (Leaders: Steve Reddy & Ian Tyler).
- Coordinate IGCP activities with palaeogeographic atlas final product of the Tectonics SRC and IGCP 440 for preliminary Palaeoproterozoic supercontinent reconstructions.
- Call for papers and for Special volume on Palaeoproterozoic Earth (edited by Reddy, Mazumder & Evans) associated with “Palaeoproterozoic Earth” session at Tectonics SRC’s "Supercontinents and Earth Evolution Symposium," in September 2005.
- Other opportunities in 2005 – tentative but under consideration – one of:
    - Field Excursion - Quadrilátero Ferrífero, Brazil, linked to Symposium of the São Francisco craton in Salvador, Bahia, August 2005. Fernando Alkmim has already agreed to lead this excursion if our project is funded.
    - Field Excursion – “Palaeoproterozoic accretion at the margin of Wyoming Craton (Cheyenne Belt) and Snowy Pass passive margin” linked to GSAm meeting in Salt Lake City, October 2005.

Year 2 (2006)

- Coordinate and convene 2nd IGCP planning meeting at either 21st Colloquium of African Geology at Maputo, Mozambique (preferable) or GAC/MAC 2006, Montreal, Canada.
- Review Tectonics SRC 2005 palaeogeographic models for Palaeoproterozoic Earth and identify key areas for prioritising future research.
- Prepare fieldguide.

- Commence compilation of regional correlation charts via regional coordinators.
- Commence data entry into database at regional level via regional coordinators.
- Opportunities in 2006 – tentative and currently under consideration.
    - Field Excursion – "Huronian Sedimentation & Penokean Tectonic Reworking" linked to GACMAC 2006 (Montreal).
    - 21st Colloquium of African Geology, 2006 – Maputo, Mozambique, with possible trips to 1) Ubende and Usagaran Belts of Tanzania plus Bangweulu block of Zambia; 2) Southern African traverse: Kaapvaal craton / Pretoria Group / Vredefort impact / Bushveld complex / Limpopo Belt.

Year 3 (2007)

- Coordinate and convene 3rd IGCP planning meeting possibly in Arizona.
- Continue compilation of regional correlation charts.
- Regional coordinators meet (Arizona?) to produce 1st draft of global Palaeoproterozoic correlation chart and review database compilation.
- Commence construction of valid, global palaeogeographic maps through the Palaeoproterozoic era.
- Opportunities in 2007 – tentative and currently under consideration.
    - Field Excursion – "Siberia – the keystone of Nuna".
    - Conference "Ores and Orogenesis: Circum-Pacific Tectonics, Geologic Evolution, and Ore Deposits". Convened by Arizona Geological Society. Alternatively GSAm Meeting (Denver) in October. Either conference could have associated field excursions to look at the assembly of the Palaeoproterozoic Mojave and Yavapai provinces and accretion of Palaeoproterozoic arcs onto Laurentia & (if not done in 2006) Palaeoproterozoic accretion at margin of Wyoming Craton (Cheyenne Belt) and the Snowy Pass passive margin sequence.
    - 15th International Conference of the Geological Society of Africa, 2007 – location to be announced. If West Africa possibility of Birimian fieldtrip.

Year 4 (2008)

- Coordinate and convene 4th IGCP planning meeting at IGC in Oslo – link to symposium on "Palaeoproterozoic Earth".
- Coordinators (and interested parties) revise draft of global Palaeoproterozoic correlation chart and present at IGC.
- Using compiled data complete 1st drafts of global palaeogeographic maps and present at IGC.
- Final revision of database.
- Call for papers for special volume linked to "Palaeoproterozoic Earth" IGC symposium.
- Opportunities in 2008 – tentative and currently under consideration.
    - 33rd International Geological Congress – Oslo, with associated fieldtrips to 1) Palaeoproterozoic of Karelia (Lake Onega), 2) the Pechenga Belt (NW Russia) or 3) Palaeoproterozoic eclogites and ophiolites of Northern Sweden.
    - Field Excursion – "Tectonic complexity in North China and links to India"
    - 22nd Colloquium of African Geology, 2008 – location to be announced.

Year 5 (2009)

- Coordinate and convene 5th IGCP planning meeting in India.
- Complete regional and global Palaeoproterozoic correlation charts for publication.
- Publish special volume from "Palaeoproterozoic Earth" IGC symposium.
- Complete GIS database of palaeomagnetic, isotopic, geochronological and mineral deposit data and make available to scientific community.
- Publish a set of global palaeogeographic maps through the Palaeoproterozoic Era.
- Opportunities in 2009 – tentative and currently under consideration.
    - IGCP Field Meeting – "Indian Connections – Palaeoproterozoic of the Singhbhum craton and the Aravalli Ranges of Rajasthan" – fieldtrips arranged pre- & post- the final IGCP meeting in India.
    - 17th International Conference of the Geological Society of Africa, 2009 – location to be announced. If West Africa possibility of Birimian fieldtrip.

10. Results expected of the project / *Résultats attendus*

a) in theoretical sciences / *en matière de sciences théoriques*
b) in applied sciences and technology / *en matière de sciences appliquée et de technologie*
c) in respect of benefit to society / *pour le bien de la societé*

We envision several facets of a final product result, in addition to incremental field guide publications and various special volumes of international journals. These include:

(1) A global tectono-stratigraphic computer-GIS database of the Palaeoproterozoic Era, with cross links to existing geochronological, stable-isotopic, and palaeomagnetic databases for the same period of time.

(2) A global tectono-stratigraphic correlation chart illustrating major events in Palaeoproterozoic Earth history, as related to the preserved geological record.

(3) A set of global palaeogeographic maps through the Palaeoproterozoic interval, including a "best guess" for the configuration of Nuna supercontinent. As of the project's closing in 2009, there may be several viable Nuna reconstructions, all depicted in a series of maps. The maps will include major sedimentary basins, orogenic belts, large igneous provinces, impact craters, and economic deposits.

The proposed IGCP project will bring together researchers from many disciplines, creating multidisciplinary links that will help unravel some fundamental issues of **theoretical** Earth science (whose needs are discussed below). In addition, some developing analytical procedures to obtain subtle clues from rocks' histories, will help drive **technology** to advance beyond the present limits of laboratory studies. Finally, the project's reconstructions of cratons in specified juxtapositions will generate new exploration models for Palaeoproterozoic ore deposits, with associated **benefits to society** at both local and global scales.

11. The following sequential results are expected (with indication of years) / *Résultats attendus à court terme (avec indication de l'année)*

Year 1 (2005).

- September 2005: Publication of Capricorn Orogen field guide (as Geological Survey of Western Australia Report).
- September 2005: Publication of Proceedings of "Supercontinents and Earth Evolution Symposium," including Palaeoproterozoic Session Abstracts.
- December 2005: Preliminary Palaeoproterozoic supercontinent reconstructions as part of Tectonics SRC output.
- Publish fieldguide from 2nd field excursion.

Year 2 (2006).
- Publication of Field excursion guidebook.
- Publication of conference abstract volume.
- Late 2006: Publication of "Palaeoproterozoic Earth" Special Volume (eds. Reddy, Evans & Mazumder) from the Tectonics SRC final meeting in 2005.

Year 3 (2007).
- Publication of Field excursion guidebook.
- Publication of conference abstract volume.

Year 4 (2008).
- Publication of Field excursion guidebook.
- Publication of conference abstract volume.
- Present correlation charts and global palaeogeographic reconstructions for Palaeoproterozoic era at IGC for group discussion and review.

Year 5 (2009).
- Publication of Field excursion guidebook.
- Publication of conference abstract volume.
- Completion of valid Palaeoproterozoic palaeogeographic maps.
- Completion of GIS databases and enable web access.
- December 2009: Publication of Special volume "Palaeoproterozoic Earth" from IGC symposium.
- December 2009: Publication of global Palaeoproterozoic correlation charts.

12. The present state of activities in this field (include the names of institutions and responsible persons) / *Etat actuel des activités dans ce domaine (inclure les noms des institutions et des personnes responsables)*

Three waves of broad geological interest are all converging upon the Palaeoproterozoic interval of Earth history and its supercontinents. One, extrapolating backward from the Meso-Neoproterozoic supercontinent Rodinia, gains strength from an enormous concentration of research generated to test the hypothesised palaeogeographic configurations of the early 1990s. This topic of pursuit, which was led in large part by the Tectonics Special Research Centre (TSRC) in Perth, Australia, as well as its intimately related IGCP Project 440, will attain a benchmark level of advancement in 2005 as these organisations complete their mandates to provide palaeogeographic maps of Rodinia and (more speculative) pre-Rodinian supercontinents. These maps, plus a corresponding global tectonic database for the Rodinian interval, will provide

a ready template for the desired products of this proposal. There is substantial overlap not only between this proposal's and those organisations' personnel (see attached letter from Svetlana Bogdanova), but also in the geological comparisons used to reconstruct various cratons in juxtaposition. This is because many of the "piercing points" used to restore Rodinia are Palaeoproterozoic features that are by implication inherited from earlier supercontinents.

Another wave of scientific excitement approaching the Palaeoproterozoic Era, is from below in the Archaean stratigraphic column. Whereas some important similarities between Archaean and "modern" processes do in fact steer toward actualistic interpretations of Earth's early history, there are also important differences. Such exceptions, elaborated in the full proposal description at #16b, below, are generally demarcated by transitions to the "modern" world between 3.0 and 1.8 billion years ago. Thus the Palaeoproterozoic Era, as seen from the perspective of an earlier Earth history, encompasses the transition away from the dominance of those early processes. Numerical modelling indicates that this transition corresponds to increasing mantle stress levels and a switch from mantle- to lithospheric- control on tectonic processes that is likely to have initially been oscillatory in nature. Studies of Palaeoproterozoic terrains should reflect this changing geodynamic environment and will provide valuable insights into the spatial and temporal nature of this fundamental global transition in tectonics. First-order controversies of Archaean geology, for example the interpretation of granite-greenstone terrains as dominantly vertical or horizontal structures, could acquire a fresh perspective if postulated models of the Archaean world are allowed to run forward in time and be compared with the Palaeoproterozoic rock record.

Finally, the third timely swell of activity advancing toward detailed and focused studies of the Palaeoproterozoic Era, is the push toward establishment of chronostratigraphically defined time intervals of the Precambrian. This ambitious effort, which enjoyed a first success earlier in 2004, with the ratification of the Ediacaran Period by the International Committee on Stratigraphy, will now continue downward through the geological time column under the leadership of Wouter Bleeker, Martin Van Kranendonk, and several others (see letters of support). Multidisciplinary study of the Palaeoproterozoic interval, as proposed herein, will set the stage for ultimate selection of Global Stratotype Sections and Points (GSSPs) by the ICS working groups, among large segments of Palaeoproterozoic time.

13. Participation / *Participation*

a) What countries and institutions are in your opinion likely to participate in the project / *Quels sont les pays et les institutions qui, selon vous, sont susceptibles de participer au projet*

The following countries either contain significant areas of Palaeoproterozoic rocks, or are home to individuals who work on these rocks and have expressed enthusiasm toward the project. Over half of these countries are already represented by geoscientists who have agreed to participate (see item **b**, below).

Algeria, Angola, Australia, Belgium, Botswana, Burkina Faso, Brazil, Cameroon, Canada, China, Congo, Denmark, Finland, France, French Guiana, Gabon, Germany, Ghana, Guyana, India, Ivory Coast, Japan, Korea, Mauritania, Mongolia, Namibia, Nigeria, Norway, Russia,

South Africa, Suriname, Sweden, Tanzania, Ukraine, UK, USA, Uruguay, Venezuela, Zambia, Zimbabwe.

b) What countries or institutions (or individuals) have already / *Quels pays ou institutions (ou individus) ont déjà*;

- agreed to co-operate / *accepté de coopérer*

Australia, Botswana, Burkina Faso, Brazil, Cameroon, Canada, China, Denmark, Finland, France, Germany, India, Japan, Korea, Namibia, Nigeria, Romania, Russia, South Africa, Sweden, Tanzania, UK, USA, Zimbabwe.

The project will be organised according to regional and topical subjects. Regional subjects are created to summarise the Palaeoproterozoic geology of a specific craton or orogen, whether this feature is contained within a single country or crosses international borders. Every major Palaeoproterozoic terrain in the world is represented by our project. Topical areas are based on geological processes that evolved substantially during the Palaeoproterozoic Era. A provisional list of regional and topical coordinators follows, except where to be determined (TBD). These individuals have already expressed keen interest in our proposal and will be directing the relevant components of our final IGCP products.

ADMINISTRATIVE DUTIES

Project co-leaders
Steven Reddy (Curtin University of Technology, Australia)
Rajat Mazumder (Asutosh College, India)
David Evans (Yale University, USA)
Project secretary
Alan Collins (University of Adelaide, Australia)
Database manager
Bruce Eglington (University of Saskatchewan, Canada)

REGIONAL COORDINATORS:

West Australia
Mark Barley (University of Western Australia)
Sandi Occhipinti (Curtin University of Technology, Australia)
North Australia
Ian Tyler (Geological Survey of Western Australia)
Peter Betts (Monash University, Australia)
South Australia-Terre Adelie
Martin Hand (University of Adelaide; to be confirmed)
TBD
India
Rajat Mazumder (project co-leader; Asutosh College, India)
H.N. Bhattacharya (Presidency College, India)

North China
- Guochun Zhao (University of Hong Kong, China)
- Mingguo Zhai (Chinese Academy of Sciences)

Siberia
- Dimitry Gladkochub (Institute of the Earth's Crust, Irkutsk, Russia)
- Alexei Didenko (Russian Academy of Sciences)

Fennoscandia
- Mikko Nironen (Geological Survey of Finland)
- TBD

Ukraine
- Svetlana Bogdanova (Lund University, Sweden)
- Roland Gorbatschev (Lund University, Sweden)

West Africa
- Félix Toteu (Centre for Geological and Mining Research, Cameroon)
- Martin Lompo (University of Ouagadougou, Burkina Faso)

Central and eastern Africa
- Abdul Mruma (University of Dar-Es-Salaam; Tanzania)
- Bert de Waele (University of Western Australia)

Southern Africa
- Nic Beukes (Rand Afrikaans University, Johannesburg, South Africa)
- Read Mapeo (University of Botswana, Lobatse)

São Francisco craton
- Fermando Alkmim (University of Ouro Preto, Brazil)
- Johildo Barbosa (Federal University of Bahia, Brazi; to be confirmed)

Amazon craton
- Reinhardt Fuck (University of Brasilia, Brazil)
- Colombo Tassinari (University of São Paulo, Brazil)

Western USA
- Karl Karlstrom (University of New Mexico, USA)
- TBD

Western Canada
- Kevin Ansdell (University of Saskatchewan, Canada)
- Sally Pehrsson (Geological Survey of Canada)

Eastern Canada / Greenland
- David Corrigan (Geological Survey of Canada)
- TBD

TOPICAL COORDINATORS

Crustal tectonics
- Steve Reddy (project co-leader, Curtin University of Technology; Australia)
- Alan Collins (project secretary, University of Western Australia)
- David Corrigan (Geological Survey of Canada)

Subduction / continental growth
- Alfred Kröner (University of Mainz, Germany)

Tim Kusky (University of St Louis, USA)
Jinghui Guo (Academia Sinica, Beijing, China)

Mantle dynamics
Paul Tackley (University of California Los Angeles, USA)
TBD

Large igneous provinces
Richard Ernst (Geological Survey of Canada)

Geochronology
Michael Wingate (University of Western Australia)
TBD

Palaeomagnetic reconstructions
David Evans (project co-leader; Yale University, USA)
Sergei Pisarevsky (University of Western Australia)
Ken Buchan (Geological Survey of Canada)

Glaciations
Andrey Bekker (Carnegie Institute of Washington, USA)
Nikolai Chumakov (Russian Academy of Sciences, Moscow)

Impacts
Lauri Pesonen (University of Helsinki, Finland)
Bruce Simonson (Oberlin College, USA)

Banded iron-formations
Bryan Krapez (University of Western Australia)
TBD

Sequence stratigraphy
Pat Eriksson (University of Pretoria, South Africa)
Rob Rainbird (Geological Survey of Canada)

Sedimentary processes
Darrel Long (Laurentian University, Canada)
Octavian Catuneanu (University of Alberta, Canada; to be confirmed)

Mineral deposits
Au: TBD
Cu: Charlie Jefferson (Geological Survey of Canada)
Fe: Mark Barley (University of Western Australia)
Mn: Jens Gutzmer (Rand Afrikaans University, South Africa)
PGEs: TBD
Pb-Zn: TBD
U: Kurt Kyser (Queens University, Canada)

Atmosphere
James Farquhar (University of Maryland, USA)
TBD

Ocean chemistry
Don Canfield (Odense University, Denmark)
Ariel Anbar (Arizona State University, USA)

Geological timescale
Wouter Bleeker (Geological Survey of Canada)
Martin Van Kranendonk (Geological Survey of Western Australia)

Biological evolution
Malcolm Walter (Macquarie University, Australia)
TBD

- shown interest in the project / *montré leur intérêt dans le projet*

Over 130 individuals have responded favourably to our announcement of intent to form this project. Once the project is established and the website created (including a subscription form for individuals' inclusion on the email distribution list), we expect that international involvement will grow substantially. Because this project is a natural extension of IGCP Project 440, Assembly and Dispersal of Rodinia, we anticipate that many of those participants (over 300 from over 40 different countries) will want to join us in our quest for earlier supercontinents.

c) What countries and/or regions are in your opinion most important to the success of the study / *Quels sont les pays et/ou les régions qui, selon vous, sont les plus importants pour le succès du projet*

Among the countries listed above, with extensive Palaeoproterozoic rock exposures, those with the largest and most important areas are Angola, Australia, Brazil, Canada, China, Finland, Ghana, India, Russia, South Africa, Sweden, Ukraine, USA, and Tanzania/Zambia (Palaeoproterozoic orogen straddling their common border). Not surprisingly, these are among the world's largest countries by area. We have obtained commitments from geoscientists residing or working in all of these countries.

14. Location of major field activities / *Localisation des activités principales de terrain*

As listed under *Item 9* (tentative work schedule), our selection of possible field excursions includes most of the countries identified in *Item 13* as most important for success of the project: Australia (2005), Brazil (2005 or later), Canada (2006), China (2008), Ghana (2007 or later), India (2009), Russia (2007 and/or 2008), South Africa (2006), Sweden (2008), USA (2005 and/or 2007), Tanzania/Zambia (2006). This list amounts to approximately two IGCP-sponsored field excursions per year, which we view as the maximum feasible under a single project.

15. Location of major laboratory research (expected or assured co-operation of laboratories) / *Identification, localisation du principal laboratoire de recherche et des laboratoires susceptible de collaborer*

The host department of this proposal, Curtin University of Technology, is internationally renowned for its world-leading geochronological facilities. These state-of-the-art high spatial resolution analytical laboratories include two Sensitive High Resolution Ion Microprobes (SHRIMPs), IR and UV laser $^{40}Ar/^{39}Ar$ facilities, and U-He dating capabilities. Curtin University also has excellent microstructural facilities that include Electron Backscatter Diffraction equipment, cathodoluminescence, and TEM.

The quest for quantitative kinematic constraints on Palaeoproterozoic supercontinents will necessarily involve palaeomagnetic data. Yale co-leader David Evans has constructed a world-class palaeomagnetic laboratory, including a cryogenic magnetometer with Caltech-designed automatic sample-changer capable of analysing 180 specimens between user control inputs. This technology will allow rapid processing of voluminous sample suites and generate important new palaeomagnetic poles to constrain Palaeoproterozoic reconstructions.

In addition to the facilities available at the proposers' institutes it is expected that this IGCP project will provide access to other laboratories around the world via the large number of active researchers who have expressed an interest in collaboration.

List of participants already committed

Australia (17)	Mark Barley, Peter Betts, Chris Carson, Peter Cawood, Alan Collins, Bert de Waele, Andrew Glikson, Russell Korsch, Bryan Krapez, Zheng-Xiang Li, Sandi Occhipinti, Steven Reddy, Ian Tyler, Martin Van Kranendonk, Malcolm Walter, Simon Wilde, Michael Wingate
Botswana (1)	Henri Kampunzu
Brazil (9)	Fernando Alkmim, Marly Babinski, Benjamin (Bley) Brito-Neves, Luiz Carlos da Silva, Reinaldo S.C. de Brito, Reinhart Fuck, Marcio Pimentel, Colombo C.G. Tassinari, Wilson Teixeira
Burkina Faso (1)	Martin Lompo
Cameroon (1)	Félix Toteu
Canada (17)	Irv Annesley, Kevin Ansdell, Wouter Bleeker, Ken Buchan, Dave Corrigan,, Bruce Eglington, Richard Ernst, Charlie Jefferson, Kurt Kyser, Darrel Long, Brendan Murphy, John Myers, Sally Pehrsson, Mary Sanborn-Barrie, Derek Thorkelson, Jan Veizer, Grant Young
China (9)	Jinghui Guo, Jianghai Li, Chuanzhou Lin, Wenjiao Xiao, Lingsen Zeng, Mingguo Zhai, Shihong Zhang, Guochun Zhao, Yue Zhao
Denmark (1)	Don Canfield
Finland (7)	Eero Hanski, Raimo Lahtinen, Satu Mertanen, Mikko Nironen, Lauri Pesonen, Kari Strand, Pekka Tuisku

France (6)	Claude Caillat, Michel Faure, Patrick Ledru, Jean-Luc Lescuyer, Jean-Pierre Milesi, Philippe Portella
Germany (4)	Wlady Altermann, Alfred Kroner, Ulf Linnemann, Cees Passchier
India (4)	Santanu Banerjee, Partha Chakraborty, Naresh Kochhar, Rajat Mazumder
Japan (1)	Maseru Yoshida
Korea (1)	Moonsup Cho
Namibia (1)	Charlie Hoffmann
Nigeria (1)	Barth Ekwueme
Romania (1)	Antoneta Seghedi
Russia (7)	Nikolai Chumakov, Alexei Didenko, Tatiana Donskaya, Dmitry Gladkochub, Eugene Mikhalsky, Eugene Sklyarov, V.V. Vernikovsky
South Africa (4)	Nic Beukes, Gerrit de Kock, Patrick Eriksson, Hielke Jelsma
Sweden (4)	Svetlana Bogdanova, Dave Cornell, Sten-Ake Elming, Roland Gorbatschev
United Kingdom (3)	Nick Butterfield, Tony Fallick, Tony Prave
United States (34)	Andrey Bekker, Mike Brown, Jeffrey Chiaranzelli, Kent Condie, Dave Des Marais, Ernie Duebendorfer, David Evans, James Farquhar, Charles Ferguson, Carol Frost, John Geissman, John Grotzinger, Judy Hannah, Richard Hanson, Paul Hoffman, Karl Karlstrom, Jay Kaufman, Martin Kennedy, Joe Kirschvink, Lee Kump, Tim Kusky, Joe Meert, Damian Nance, Hiroshi Ohmoto, Eben Rose, Theresa Raub, John J.W. Rogers, Jim Sears, Bruce Simonson, Alexei Smirnov, Jon Spencer, Holly Stein, Robert Stern, Paul Tackley
Zimbabwe (1)	Ben Mapani

Summary sheet

PALAEOPROTEROZOIC SUPERCONTINENTS AND GLOBAL EVOLUTION:

A Complete Tectonic Cycle Representing the Evolving Core, Mantle, Lithosphere, Hydrosphere, Atmosphere, and Biosphere

General aims of the project

The Palaeoproterozoic Era (2500–1600 million years ago) was a period of profound global change in the Earth system, reflected in the breakup and formation of two supercontinental landmasses. This project seeks to understand the nature of this transitional period of our planet's history in relation to underlying geodynamic controls, specifics of continental palaeogeography and tectono-stratigraphy, and implications for environmental conditions surrounding the diversification of microbial life.

Objectives and measurable outputs

Such a goal requires international multidisciplinary co-operation amongst specialists in Palaeoproterozoic regional geology and geological processes. The objectives of this project are to encourage and facilitate scientific collaboration, develop a greater understanding of the Earth and its evolution, and foster the dissemination of knowledge about this important geological era amongst the wider geological community. Co-operation will be encouraged by regular field meetings in different countries, providing specialists in laboratory, field and theoretical methods with a common ground to discuss ideas. The framework for discussion includes regional and topical focus areas which will provide the input data for three principal measurable outputs: 1) GIS database; 2) global rock correlation charts; and 3) valid palaeogeographic maps for the Palaeoproterozoic Era. A fourth important output is the scientific publication of numerous thematic journal volumes and field guidebooks.

Geoscience in the service of society

The above outputs will provide a spatial and temporal summary of Earth's Palaeoproterozoic rock record and global evolution that will be available to the international geological community. Such data are likely to have profound implications for many areas of the Earth sciences and may directly affect our understanding of, for example, the birth of plate tectonics, the tectonic settings of ore deposits, and the oxygenation of the atmosphere.

The proposed project draws momentum from the recent IGCP Project 440 "Assembly and Breakup of Rodinia", which provides a fundamental starting point for the reconstruction of older supercontinent configurations. In addition, there are connections with existing projects 474 (Depth Images of the Earth's Crust), 485 (The Boundaries of the West African Craton), and 493 (The Rise and Fall of the Vendian Biota) and recently completed Projects 426 (Granite Systems and Proterozoic Lithospheric Processes), and 453 (Modern and Ancient Orogens).

Our proposal announcement has already elicited responses from over 130 scientists among numerous geological disciplines in more than twenty countries. Our field excursions will visit the geologically most important Palaeoproterozoic regions in Australia, Asia, Europe, Africa, and the Americas. We will coordinate these activities with workshops and symposia at related conferences, bringing together a vibrant international group of researchers from academia, governments, and industry.