

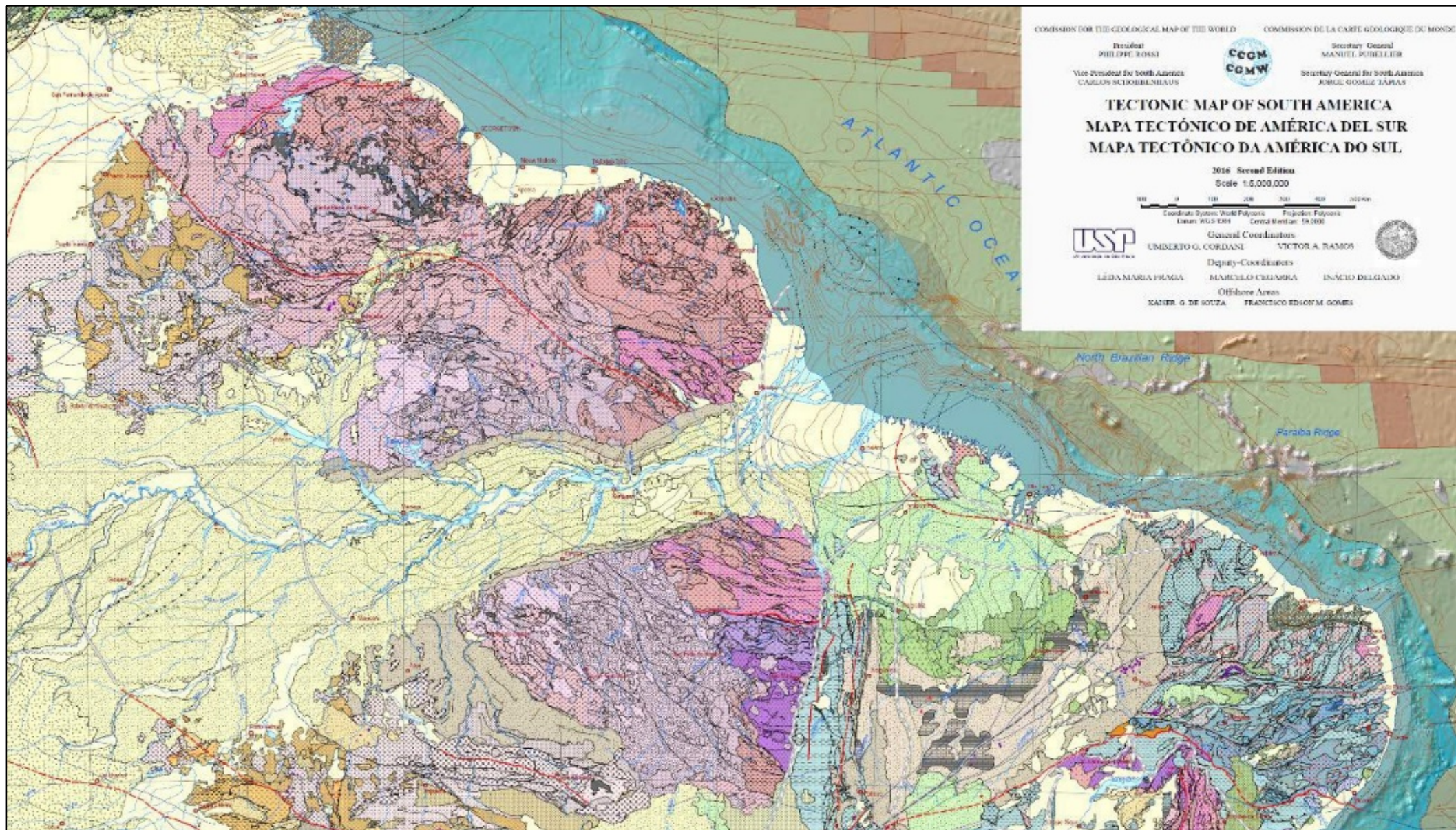


SAXI 2 Introduction



Key outcomes from SAXI Stage 1:

1. SAXI Exploration GIS including new 2M-scale structural interpretation of the regional magnetic dataset
2. Exploration geoscience audit and gaps analysis
3. Geochronological sampling in the Guiana Shield and Borborema regions
4. Conference
5. Training course
6. Assembly of an expert team
7. Compilation of sponsor research priorities.



The project as a whole will deliver:

- Analysis of major tectonic structures in the Archean and Paleoproterozoic of South America and their relationship to mineralisation of the Transamazonian belt
- A harmonised analysis of the lithostratigraphy of North-East South America
- Detailed studies of South American ore deposits
- An updated SAXI GIS
- Training of regional geoscientists in the techniques of exploration geology via in-country short courses and annual workshops as necessary to facilitate the transfer of knowledge of the outcomes of the project to sponsors
- Training of young South American geoscientists via a suite of MSc and PhD projects directly funded by this project or in partnership with other funding sources.

Amira Global's **P1061B “South American Exploration Initiative (SAXI) Stage 2: The tectonics, architecture and metallogeny of the Proterozoic of North-East South America”** project builds upon the successes of the Stage 1 project to provide a once in a generation opportunity to tackle some the major outstanding questions related to the tectonics and metallogenesiis of the region:

1. What is the regional stratigraphic framework and how does this control mineralisation?
2. What is the structural architecture of the region and how does it localise ore formation?
3. What is the thermal and intrusive history of the region?
4. How does the tectonic evolution and associated magmatism compare with cratonic blocks of similar age and prospectivity?

A key aim of SAXI Stage 2 is to augment the exploration efforts currently taking place by enhancing stakeholders understanding of the exploration potential of the Guiana Shield. The principal motivations for undertaking this initiative are to:

- Assist exploration companies in focusing their activities in areas of maximum prospectivity in both greenfield and brownfield areas
- Identify and where possible reduce data and information gaps, in particular in geophysics, geochemistry and geochronology
- Collate the results of the initiative into a single database of NE South American exploration geoscience data, open to all sponsors and local researchers
- Ensure that research is provided in the form of high impact deliverables focused on providing data and information with maximum impact for mineral explorers in the region
- Assist local governments and Geological Survey Organisations in the region in their role of providing pre-competitive data and information, beyond which point the exploration industry takes over. This will be achieved by identifying what pre-competitive data and information is required by the exploration industry in order to further stimulate inward exploration investment
- Draw and build upon existing resources, and expertise, both local and international
- Maximise the collaborative involvement of local researchers, and ensure the proper transfer of knowledge, supported by training as appropriate, to local geoscientists to enable them to support the future requirements of the exploration and mining industry.

Guyana potential research areas:

- **Toroparu/Aurora region (Central/ Western Guyana)**
 - Two most important gold deposits in Guyana (~10 Moz-Toroparu and ~5 Moz-Aurora): integrate company data and use mine camps as a base of operations if possible
 - Investigate greenstone belt stratigraphy and determine deformation history. The Makapa-Kuribrong Shear Zone, identified from regional aeromagnetic data, passes through this region. Determine its kinematics, geodynamic significance and relationship to Au deposits in the region
 - Collect geochronology samples on major plutonic units, felsic volcanic rocks, cross-cutting dikes and detrital zircons to constrain timing of greenstone belt deposition and deformation.
- **Karouni/Omai (Central Guyana)**
 - Host to the Karouni (~1 Moz) and Omai (~5 Moz) gold deposits. Detailed mapping, geochronology and whole rock geochemistry on plutonic rocks and whole rock geochemistry on volcanic and sedimentary rock in this region already completed (Tedeschi PhD, Voicu PhD, Elliot PhD) with well-defined stratigraphy
 - Conduct a detrital zircon studies on previously mapped sedimentary rocks
 - Date felsic volcanic rocks identified in both in drill core and regionally to constrain timing of greenstone belt deposition.
- **Mahdia/Eagle Mountain (Central Guyana)**
 - Site of the largest alluvial goldfield in Guyana and the Eagle Mountain gold deposit (~1 Moz). Unknown greenstone belt stratigraphy, close to contact with the overlying Muruwa and Roriama Formations. Close to the southern province boundary
 - Investigate greenstone belt stratigraphy and determine deformation history. The Makapa-Kuribrong shear zone is also interpreted to pass through this region.
- **Mathews Ridge region (NW Guyana)**
 - Prevailing trend of stratigraphy rotated by 90 degrees, suggesting a different deformation regime?
 - Abundant pelitic sedimentary rocks (Barama Group) which look similar to the Armina Formation in Suriname, and include banded manganese formation and intercalated pyroclastic volcanic rocks => good site to date felsic volcanic rocks and detrital zircons to establish the equivalency of the sedimentary sequences in the greenstone belts
 - Hf on a late syenite intrusion in the area from SAXI 1 indicates recycled Archean crust, understand the boundaries and geodynamic significance of this zone.
- **Eastern Guyana (border region with Suriname)**
 - No known Au deposits but need Hf samples to fill in a gap in coverage
 - Barica Gneiss, outcrops along the Essequibo River near Bartica.

Suriname potential research areas :

- **Paramaka metavolcanic and minor metasedimentary rocks**
 - Localities include the Saramacca gold prospect, Poederberg, Balling Soela (quarry for Afobaka dam), ultramafics Bemau area
 - Mafic and interbedded felsic unit's ideal for correlative purposes across the basin. Data will be used to support crustal construction models and linked to petrogenesis in Module 2
 - Interbedded organic-rich shales, manganese carbonates and gondites, itabirites and other chemical sediments (Plet Rug, Maripa Hill, Apoma Soela Marowijne) indicate connectivity of basins, extent of oxygenation and redox stratification with implications for Au deposition.
- **Armina metagreywackes**
 - Merian mine pit, Koolhoven Mine, Marowijne and Coppename River transects, GMD core store
 - Focus on shale geochemistry and chemical sediments for paleoredox and with sandstones and conglomerates for provenance studies (U-Pb zircon analysis and clast analysis), these results will be integrated with the results obtained in Module 2.
- **Rosebel meta-arenites and meta-conglomerates**
 - Makambi Creek conglomerates near Brownsberg, drillcore from Rosebel Pit, GMD core store
 - Focus on polymict conglomerate horizons with a high potential for tracing provenance areas for detrital zircon and clast analysis, especially Rosebel Formation, East Pay Caro Mine, Rosebel Pit, Mayo Pit, Marowijne River Ga Kaba soela.
- **Sara's Lust and Kwai-Kwai high-grade gneisses**, and their transitions to the Kabel TTG bodies, Patamacca two-mica granites and gold-bearing greenschist-facies metavolcanic and metasedimentary rocks (see above).

For each of the listed localities the knowledge gaps to be addressed include:

- Stratigraphy within greenstone belts
 - Integrate existing work in the literature, geological surveys, exploration/mining companies and by previous master's and PhD students
- Relative and absolute timing of stratigraphy, magmatism and deformation
- Significance and kinematics of regional scale shear zones
 - Target transects based on regional geophysics
- Characterisation of gold occurrences
- Timing of deformation, structure and Au, relationship with regional scale events.

Each knowledge gaps will be addressed through the following work program.

Active Modules	Module leaders	Lead Institution
Module 1 Updated 1M Lithostratigraphic mapping	Tedeschi , Jessell, Perrouty	Laurentian University
Module 2: Magmatic evolution and petrogenesis	Thebaud , Mason, Tedeschi	UWA
Module 3: Mineral deposits and systems analysis	Perrouty , Hagemann, Tedeschi	Laurentian University
Module 4: Shield-scale structural and thermal-tectonic evolution	Vanderhaeghe , Eglinger	University of Toulouse
Module 5: Capacity building including support for regional geoscience MSc Program	Wong, Kroonenberg, Jessell , Kioe-A-Sen	Adekus
Module 6: Project coordination	Jessell	UWA
Module 7a: Unravelling the Archean and Paleoproterozoic crustal evolution in the SE Guiana Shield, Brazil	Lafon	UFPA
Module 7b: Mineral system analyses of deposits and mineralised areas in the Amapá region, Brazil	Figueiredo e Silva , Hagemann, Lobato	UFMG
Module 8c: Petrological and geochemical study of the French Guiana Armina and Rosebel-Bonidoro units: investigating regional metamorphism and gold mineralisation	Aergeerts	BRGM
Module 10a: Fertility and tectonic evolution of igneous and plutonic suites across the Guiana Shield	Loucks	UWA
Module 10b: Orocaima Igneous Belt (Roriana-Guyana-Suriname)	Fraga	CPRM

SAXI Online Database

AMIRA Global will provide all sponsors with a copy of the SAXI 1 database, in addition the vector layers from this database are also available online

