

# **TECTONIC MAP OF SOUTH AMERICA**

**Umberto Cordani – Brazilian Shield**

**Victor Ramos – Andean Cordillera**

**Inácio Delgado and Lêda Fraga – CPRM**

**Marcelo Cegarra – SEGEMAR**

**Kaiser de Souza and Francisco Edson Gomes – Oceans**

**More than 100 collaborators from different sources**

**Main criteria for the map layout and choice of legend symbols**

## **Tectonic history for South America**

**Archean** – Coherent continental nuclei

**Paleoproterozoic** – Transamazonian provinces (Columbia?)

**Mesoproterozoic** – Grenvillian belts (Amazonia in Rodinia)

**Neoproterozoic** – Pan-African belts (West Gondwana)

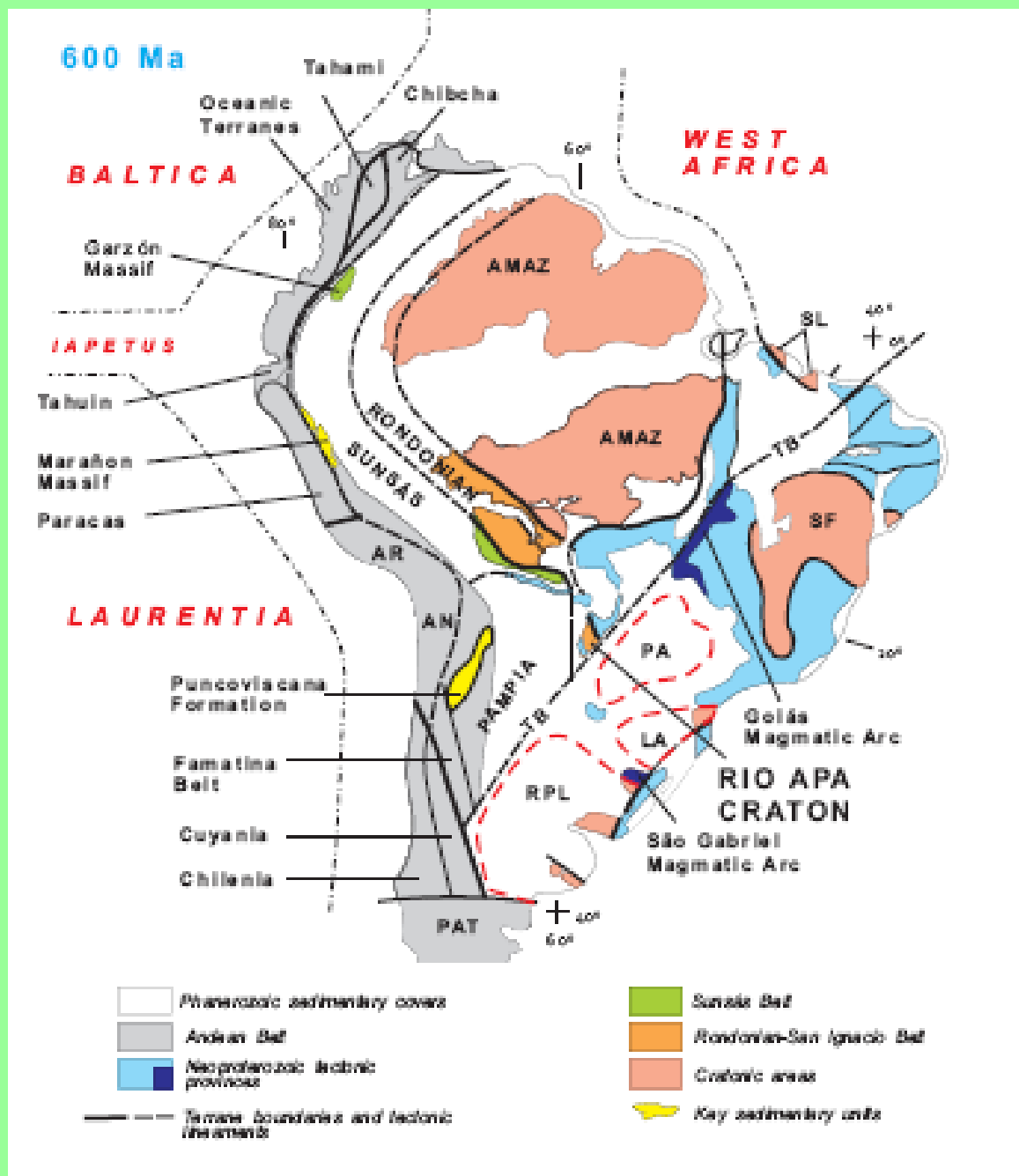
**Early Paleozoic** - Initial subduction of the proto-Pacific Plate

**Late Paleozoic** - Hercynian cycle (Amalgamation of Pangea)

**Meso-Cenozoic** - Andean orogenic cycle (Disruption of Pangea, subduction of the Pacific Plate, interaction with the Caribbean and Scotia plates and formation of the South Atlantic basin)

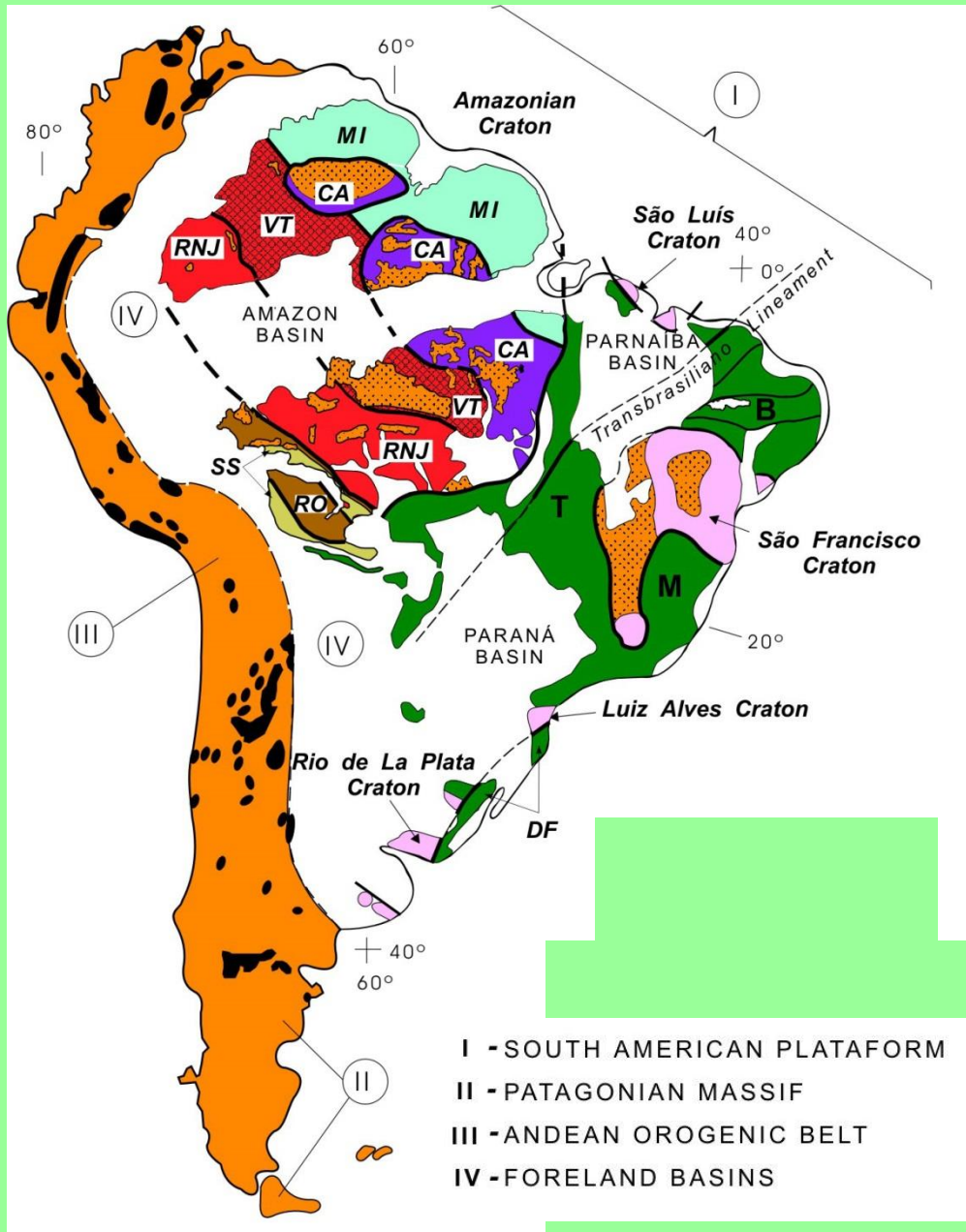
# South America

Amalgamation of West Gondwana, separation from Laurentia and Baltica and addition of a few exotic terranes



Cordani et al., 2010

# TECTONIC PROVINCES OF SOUTH AMERICA



## Amazonian Craton

**CA** Central Amazonian Province

**MI** Maroni-Itacaiunas Province

**VT** Ventuari-Tapajós Province

**RNJ** Rio Negro-Juruena Province

**RO** Rondonian-San Ignácio Province

**SS** Sunsás Province

## Smaller cratonic masses

São Luís Craton

São Francisco Craton

Luiz Alves Craton

Rio de La Plata Craton

## Sedimentary covers

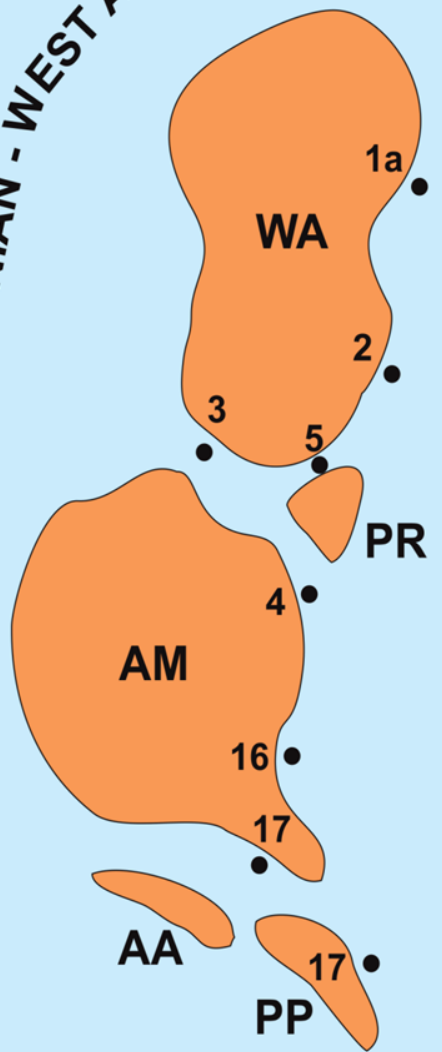
Phanerozoic

Precambrian

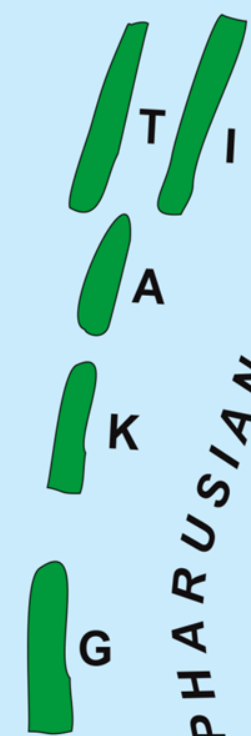
Andean belt, with Precambrian outcrops

Neoproterozoic tectonic provinces

AMAZONIAN - WEST AFRICAN BLOCK

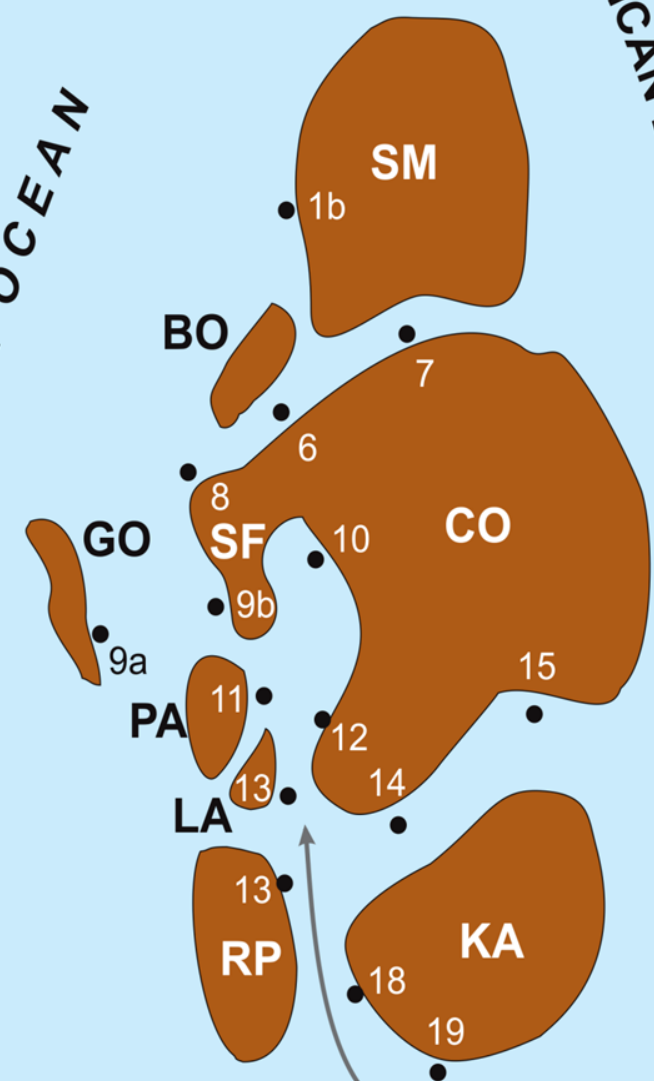


800-900 Ma



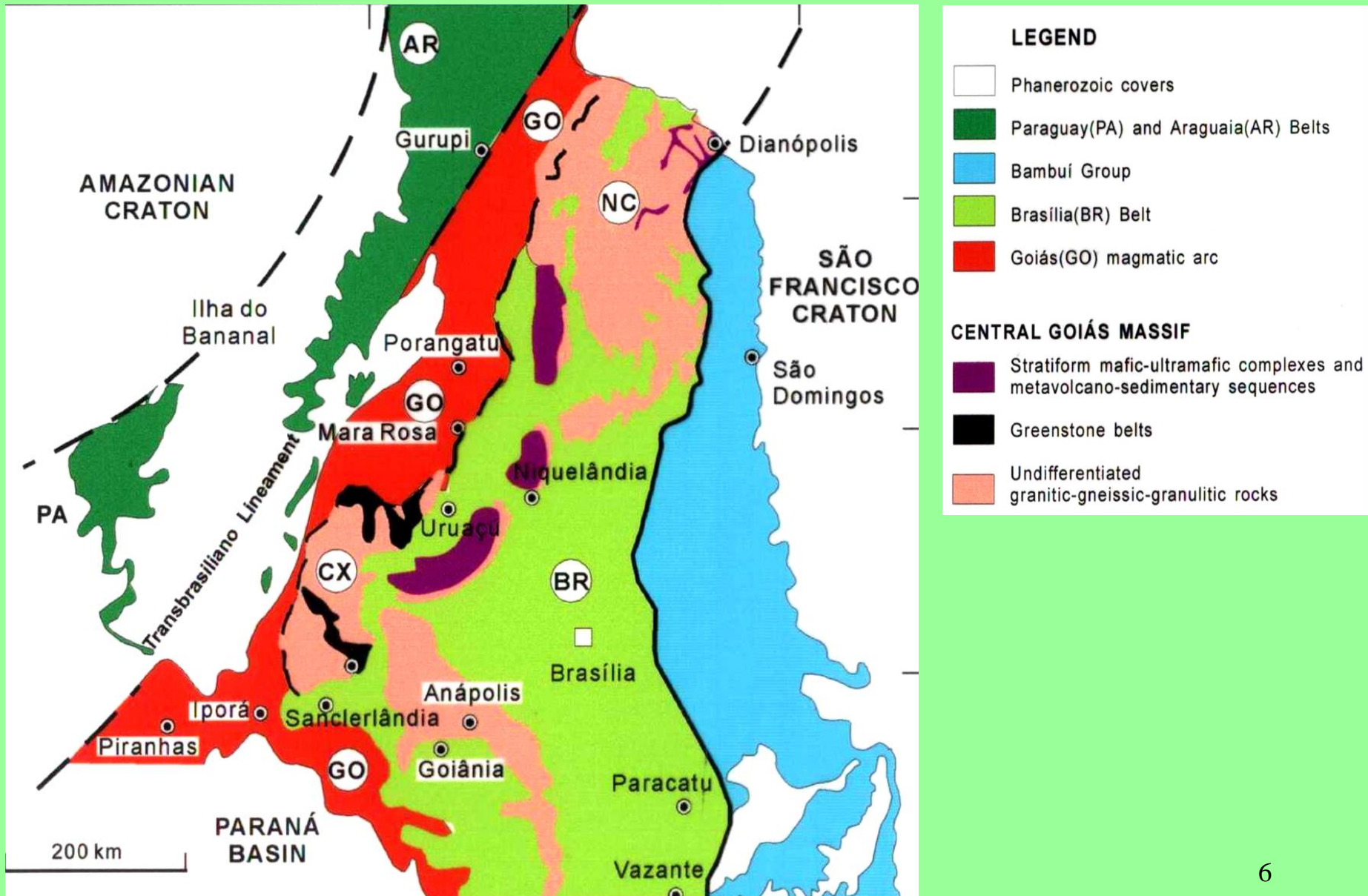
GOIÁS-PHARUSIAN OCEAN

CENTRAL AFRICAN BLOCK



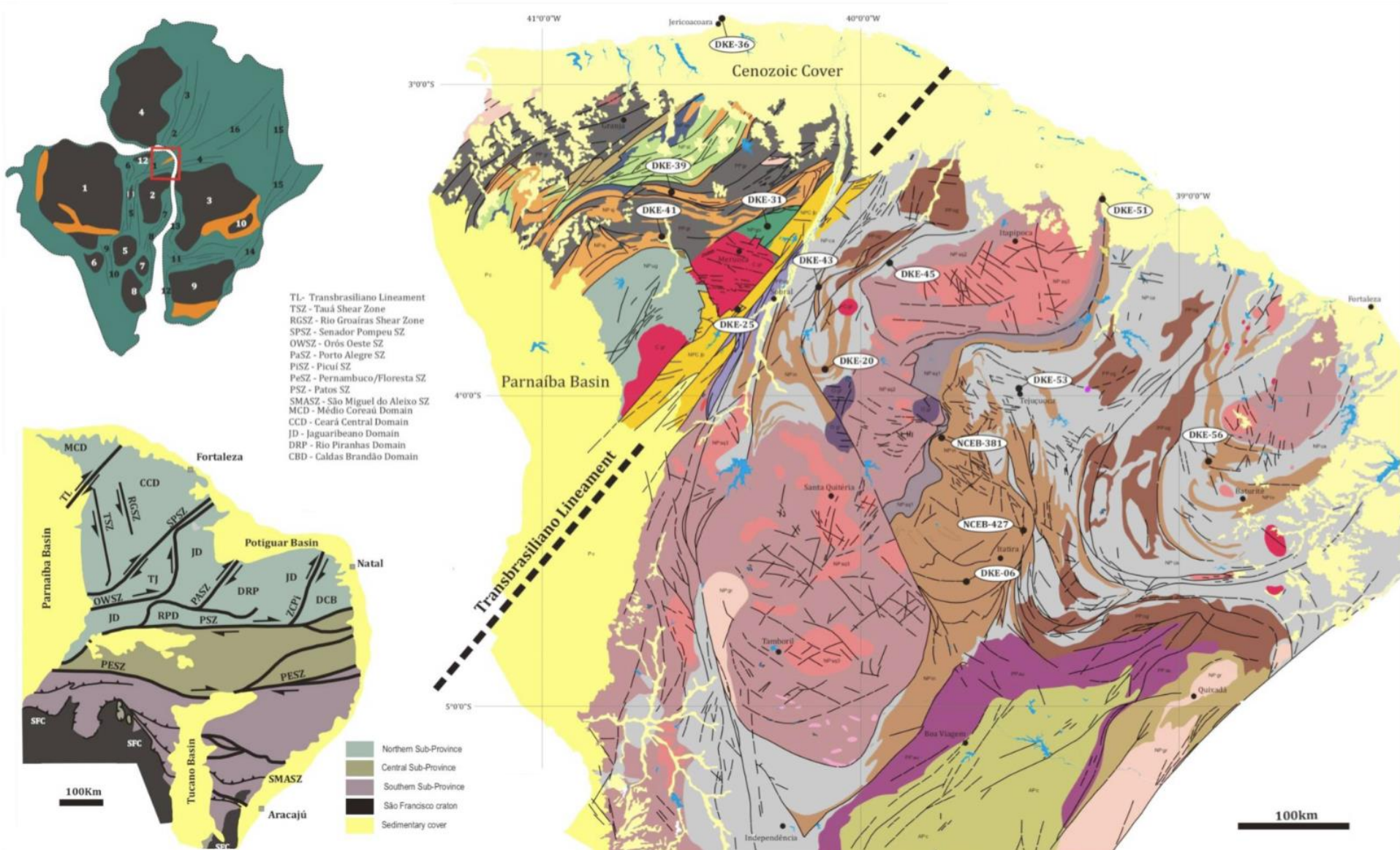
ADAMASTOR OCEAN

# TOCANTINS TECTONIC PROVINCE

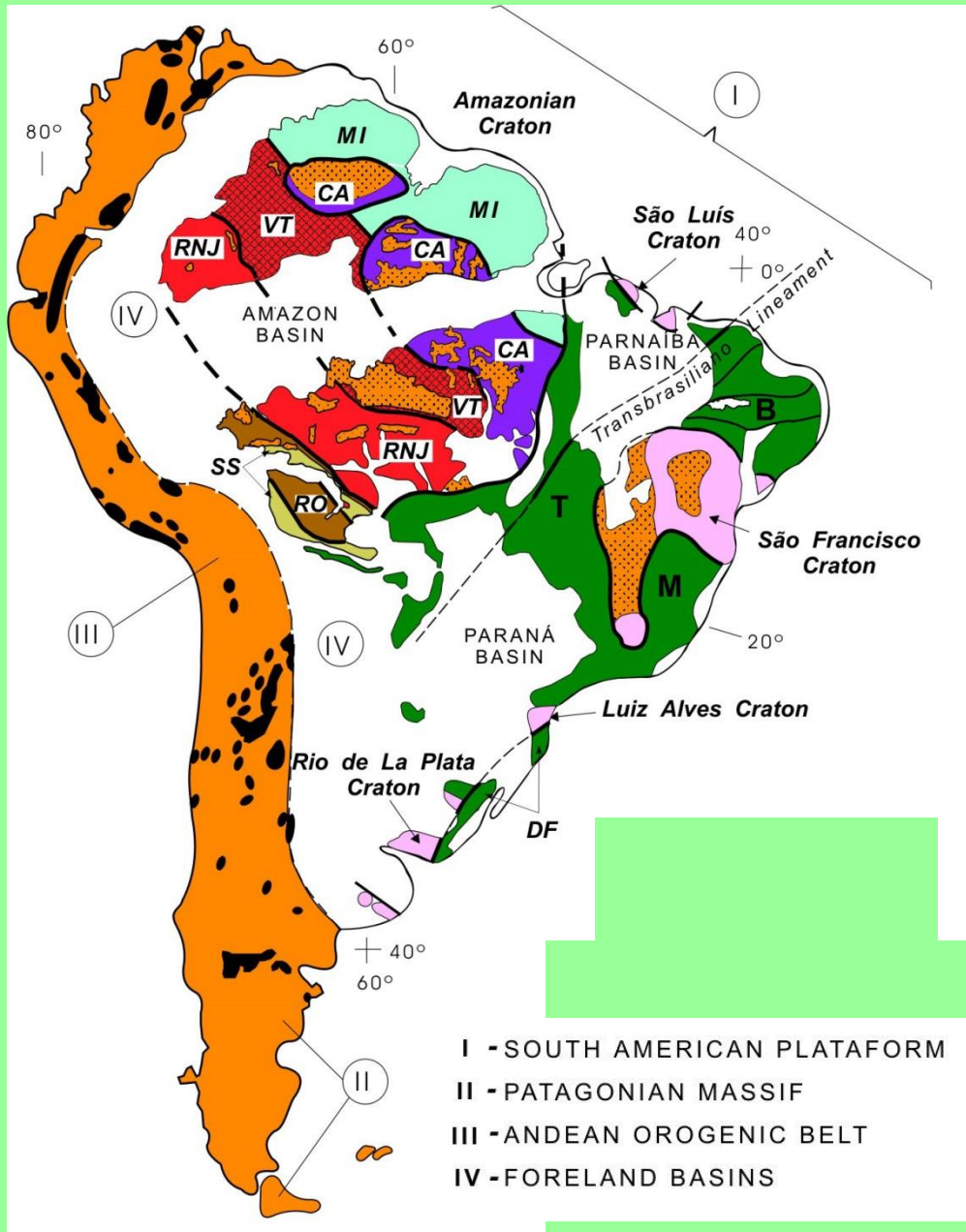




# Geologic map of Ceará State location of sampling for detrital zircon



# TECTONIC PROVINCES OF SOUTH AMERICA



## Amazonian Craton

**CA** Central Amazonian Province

**MI** Maroni-Itacaiunas Province

**VT** Ventuari-Tapajós Province

**RNJ** Rio Negro-Juruena Province

**RO** Rondonian-San Ignácio Province

**SS** Sunsás Province

## Smaller cratonic masses

São Luís Craton

São Francisco Craton

Luiz Alves Craton

Rio de La Plata Craton

## Sedimentary covers

Phanerozoic

Precambrian

**Andean belt, with Precambrian outcrops**

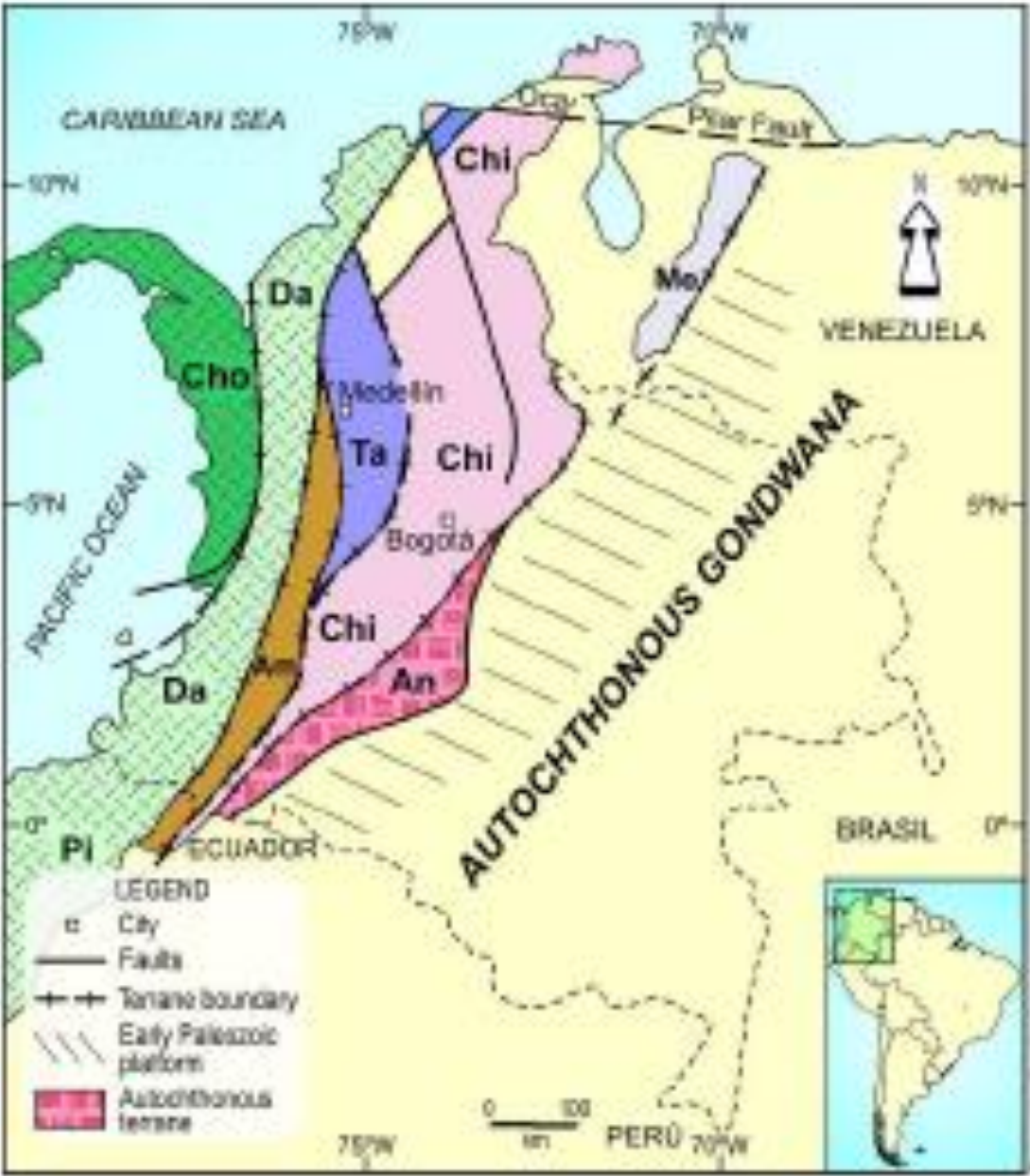
**Neoproterozoic tectonic provinces**



# Main allochthonous terranes of the Northern Andes

An = Andaqui, possibly autochthonous

Ramos et al., 2009



# UNIFIED LEGEND - 1:5 million scale

- 1 – Show the areas of exposed cratonic nuclei, marginal belts and sedimentary covers, with original tectonic environments
- 2 – Indicate the age of tectonic cycles
- 3 – Identify tectonic elements within orogenic context
- 4 – Display relevant geophysical, linear and punctual features

## ANDES

**Suprastructure** – Non metamorphic or low-grade metamorphism, with restricted areas of reworked basement – Visible sutures of allochthonous terranes.

## BRAZILIAN SHIELD

**Infrastructure** – Deep crustal levels, with medium-high grade metamorphism obliterating original tectonic environment .  
Concealed sutures within complex tectonic units.

# **TECTONIC MAP OF SOUTH AMERICA**

## **Tentative Outline for background colors**

**CENOZOIC – Yellow, with two tones**

**KS – Lighter Green**

**JK – Darker Green**

**PZ2 – Lighter Brown**

**PZ1 – Darker Brown, Magenta**

**N2 – Lighter Blue**

**N1 – Darker Blue**

**M2 – Lighter Orange**

**M1 – Darker Orange**

**P3 – Lighter Pink**

**P2 – Darker Pink**

**P1 – Red**

**A2 – Violet**

**A1 – Purple**

# Tectonic environments related to sedimentary basins

**Unconsolidated cover**

**Carbonate dominant intracratonic basin**

**Siliciclastic dominant intracratonic basin**

**Passive margin basin**

**Foreland basin**

**Rift related basin**

**Arc related basin**

**Forearc basin**

**Retroarc basin**

**Intra-arc basin**

**Accretionary prism**



# Arc related tectonic environments

**Island Arc or Oceanic Plateau**

**Ophiolite**

**Continental Magmatic Arc**

**Volcanic arc**

**Magmatic Syn-collisional**

**Plutonic arc**

**Plutonic Late-orogenic**

**Volcanic retroarc**

**Volcanic Late-orogenic**

**Plutonic retroarc**

**Plutonic Post-orogenic**

**Volcanic Post-orogenic**

## Other tectonic environments

## Intra-plate tectonic environments

Greenstone belt

Plutonic TTG-type

Low-grade Metamorphic

Medium-grade Metamorphic

High-grade Metamorphic

Felsic Volcanics Rift-related

Rift related cont felsic intrusives

Within-plate Volcanic Mafic

Within-plate Magmatic Alkaline

Within-plate Máfic-Ultramáfic Plutonic

Within-plate Magmatic A-type and AMCG-type extensional

**THANK YOU !**