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DIFFERENTIAL EXHUMATION OF CRATONIC AND NON-CRATONIC LITHOSPHERE REVEALED BY APATITE FISSION-TRACK THERMOCHRONOLOGY ALONG THE EDGE OF THE SÃO FRANCISCO CRATON, EASTERN BRAZIL

GHENT UNIVERSITY

FACULTY OF SCIENCES

PrInt

UFMG UNIVERSIDADE FEDERAL DE MINAS GERAIS

PhD candidate

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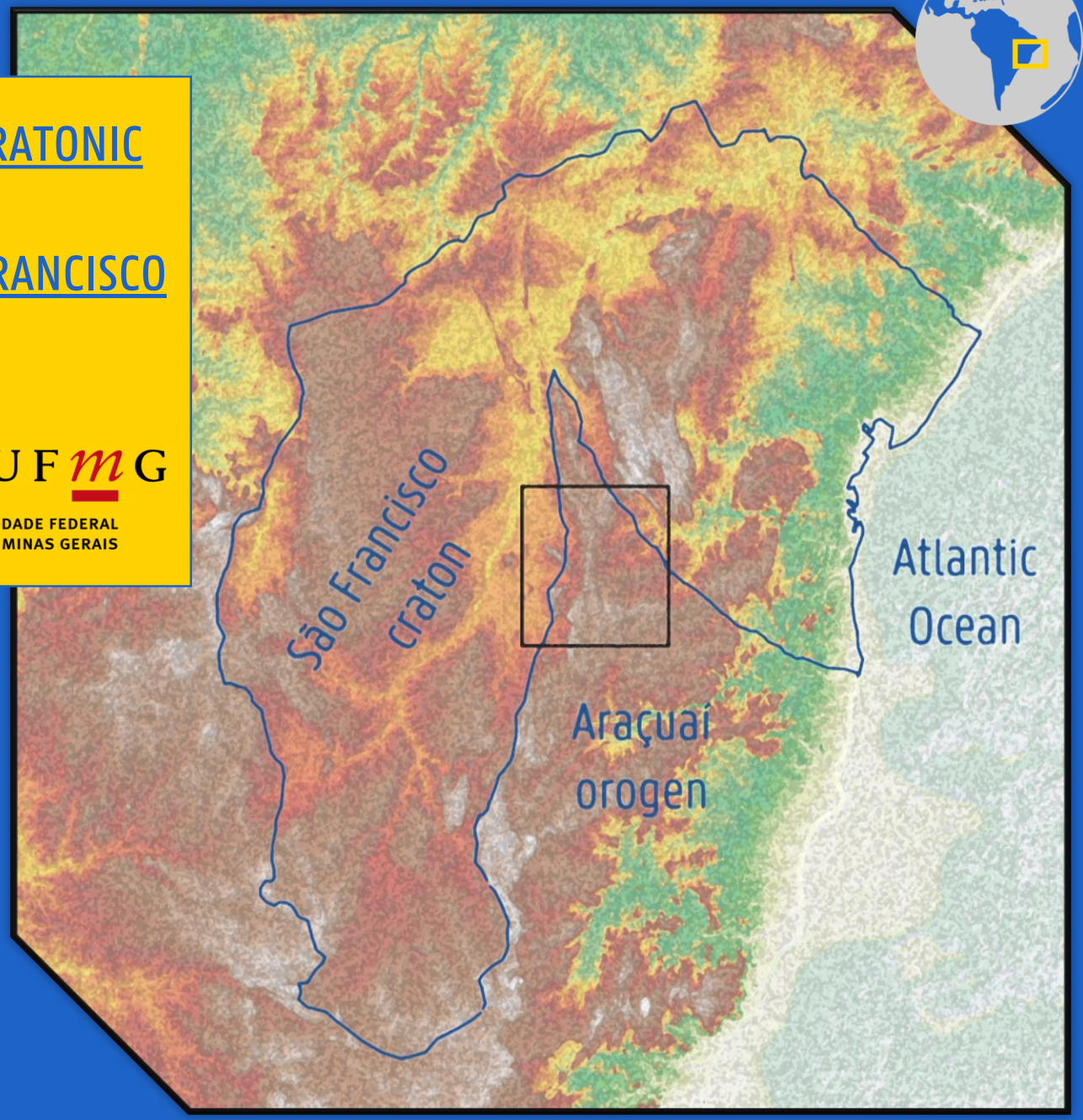
(1) Ghent University (BEL)

(2) Universidade Federal da Bahia (BRA)

(3) Universidade Federal de Minas Gerais (BRA)



Phanerozoic exhumation of Cratons vs. (Pre)Cambrian orogens

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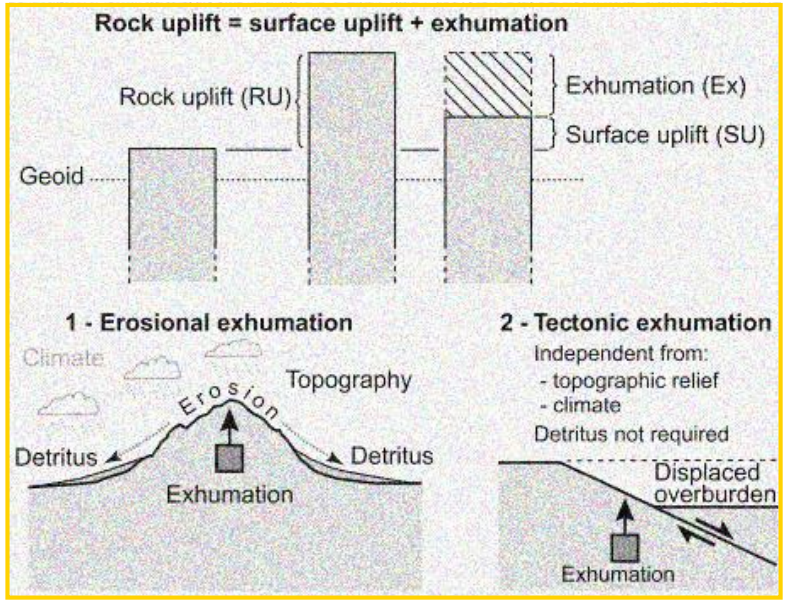
Tectonic

Stress + Lithosphere



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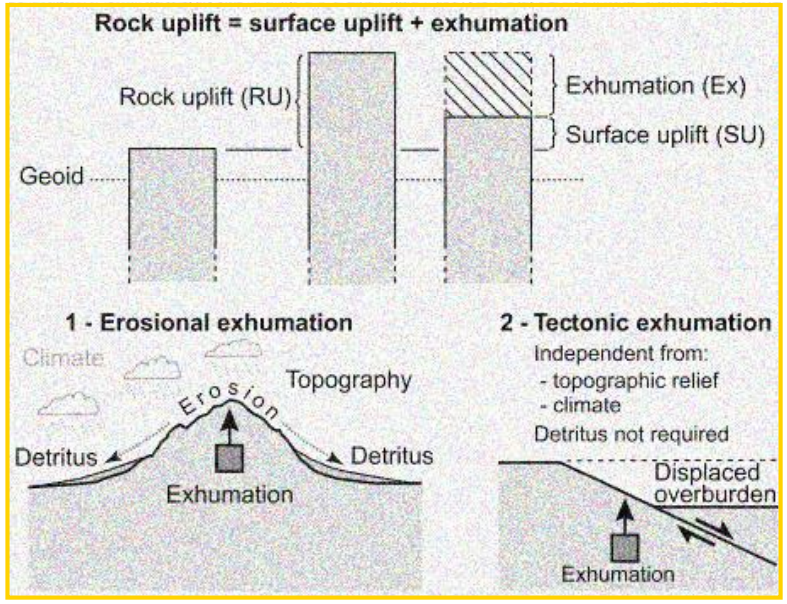

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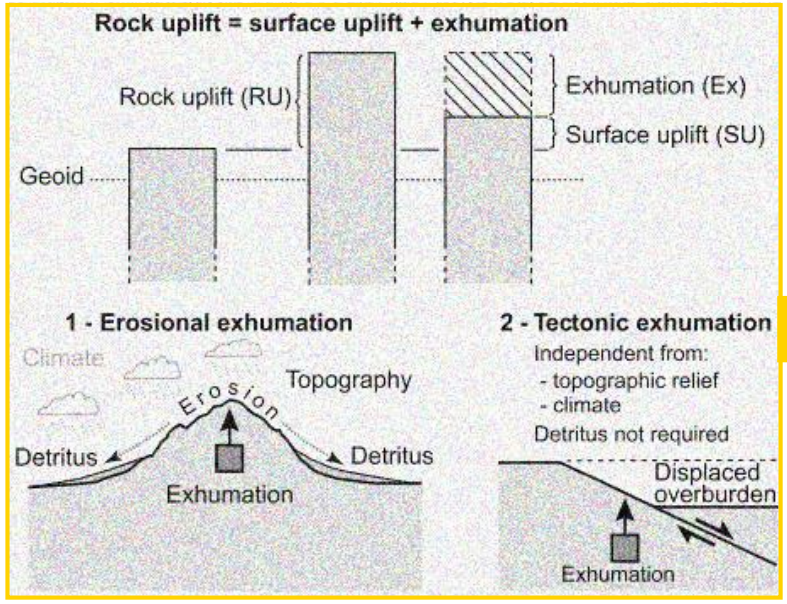

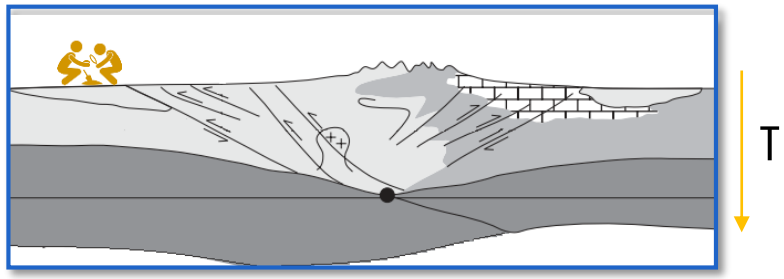

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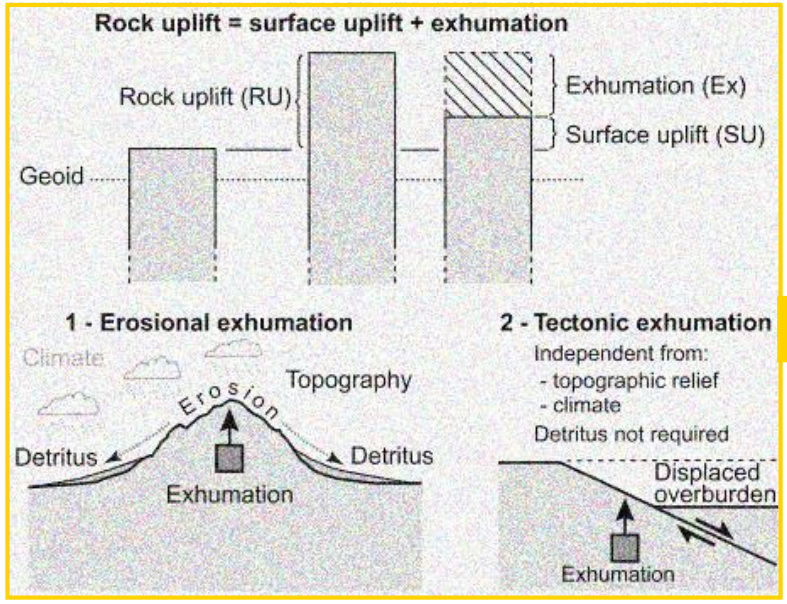

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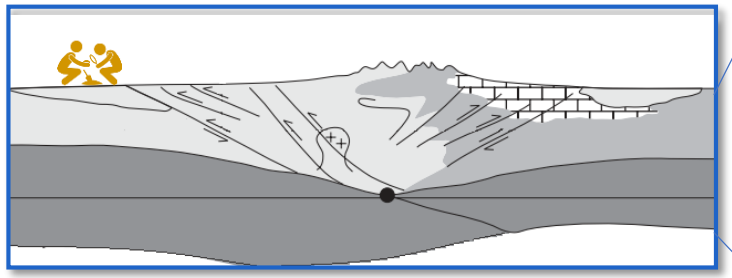

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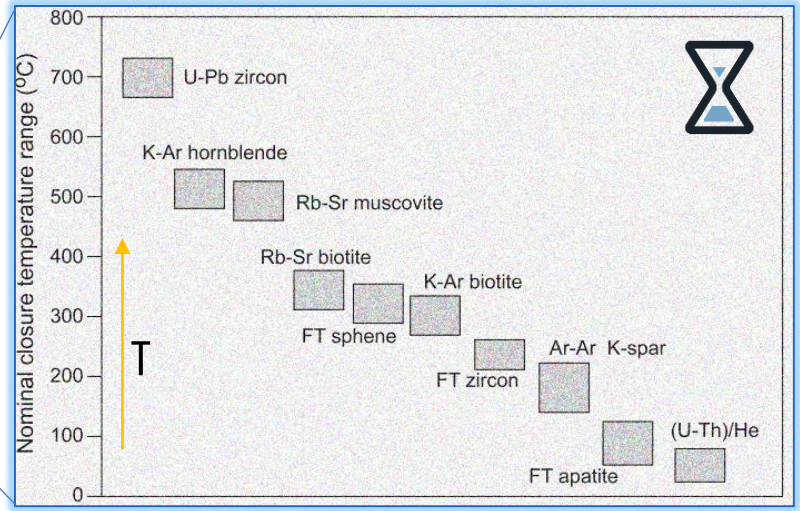

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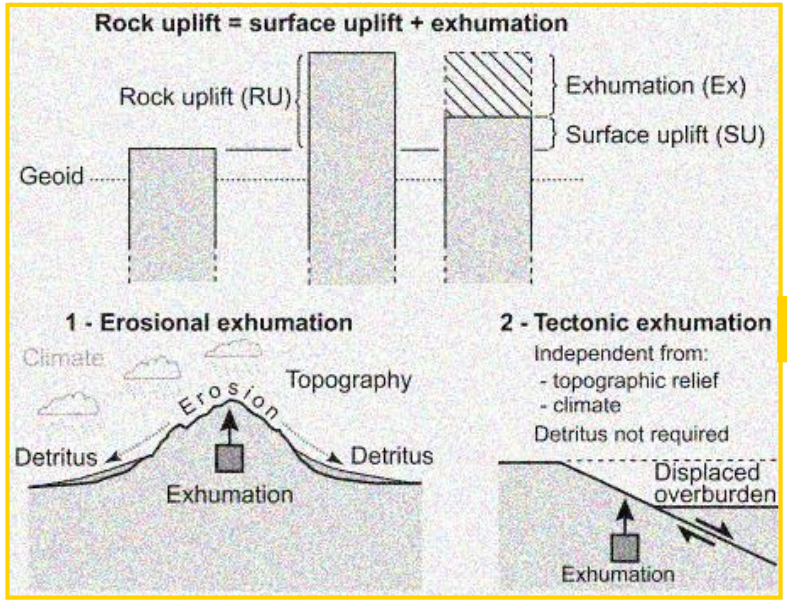

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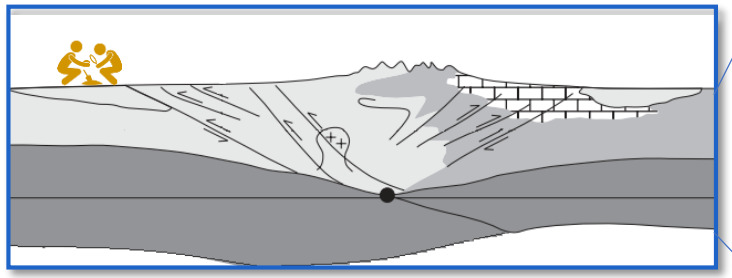

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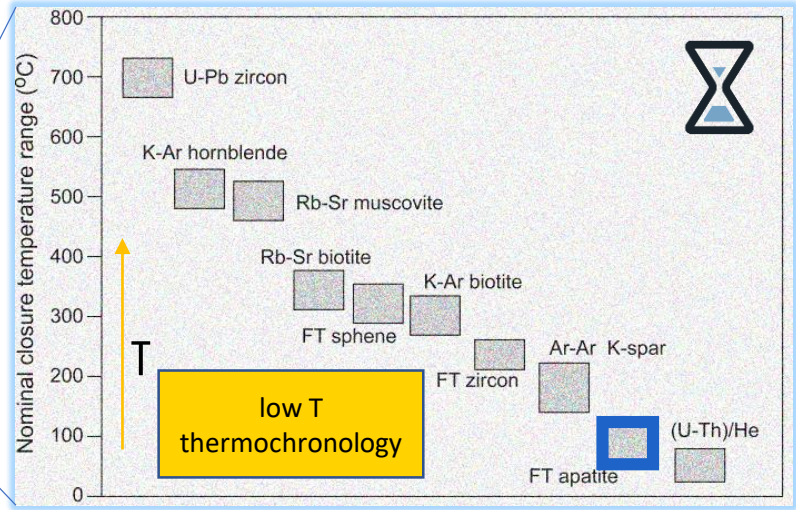

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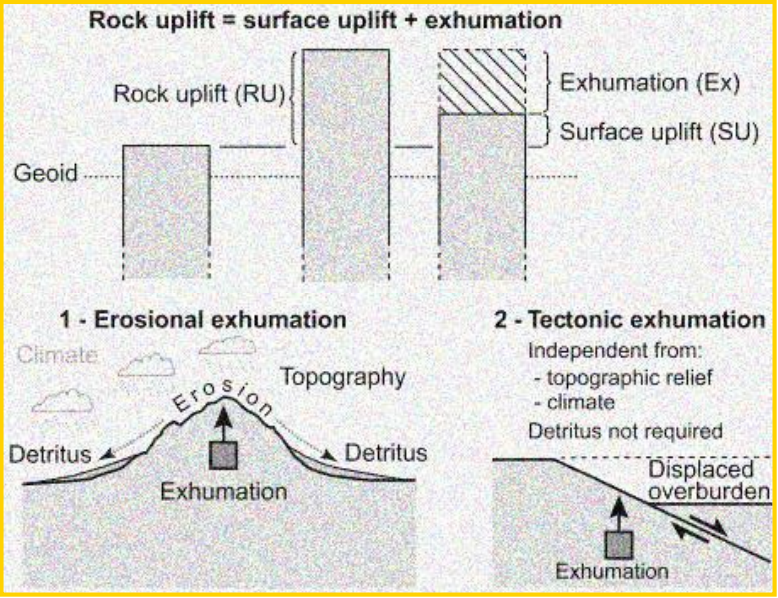

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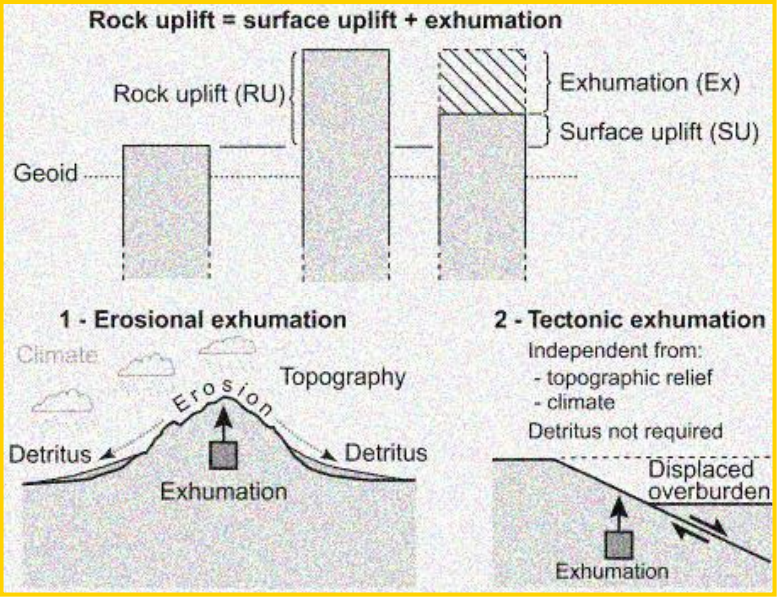

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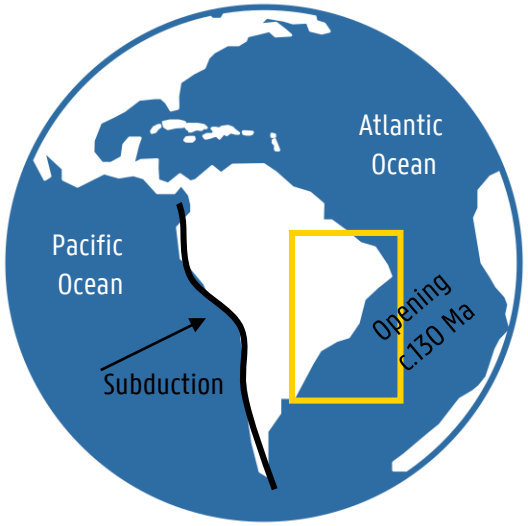

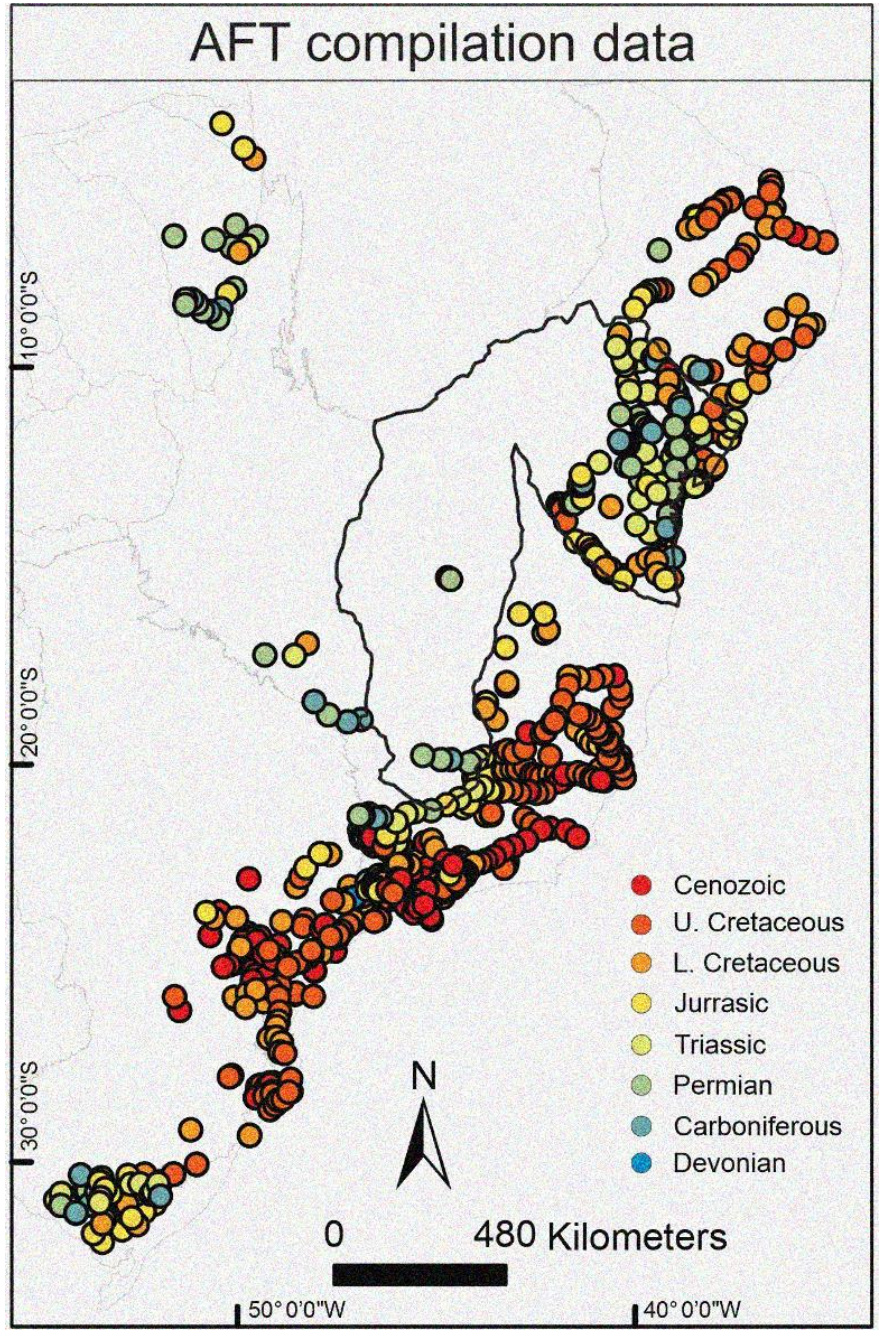

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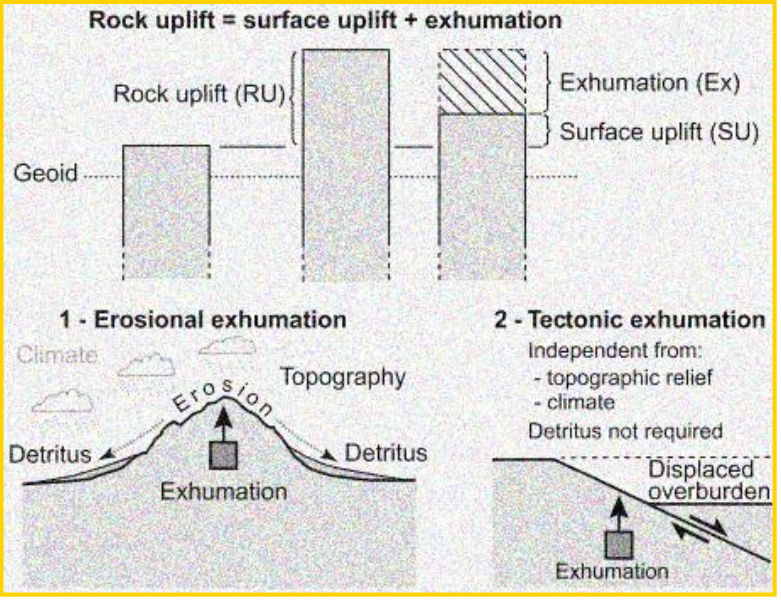

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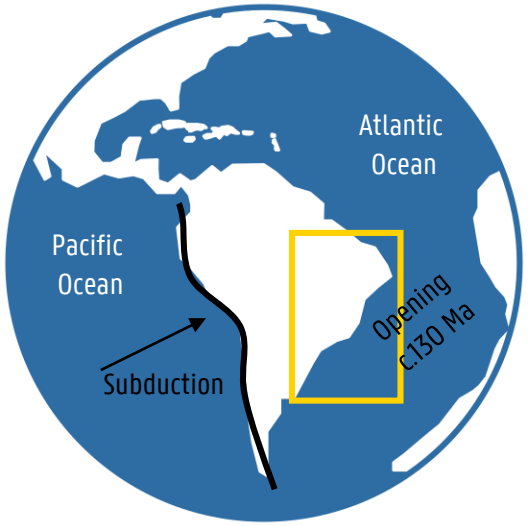

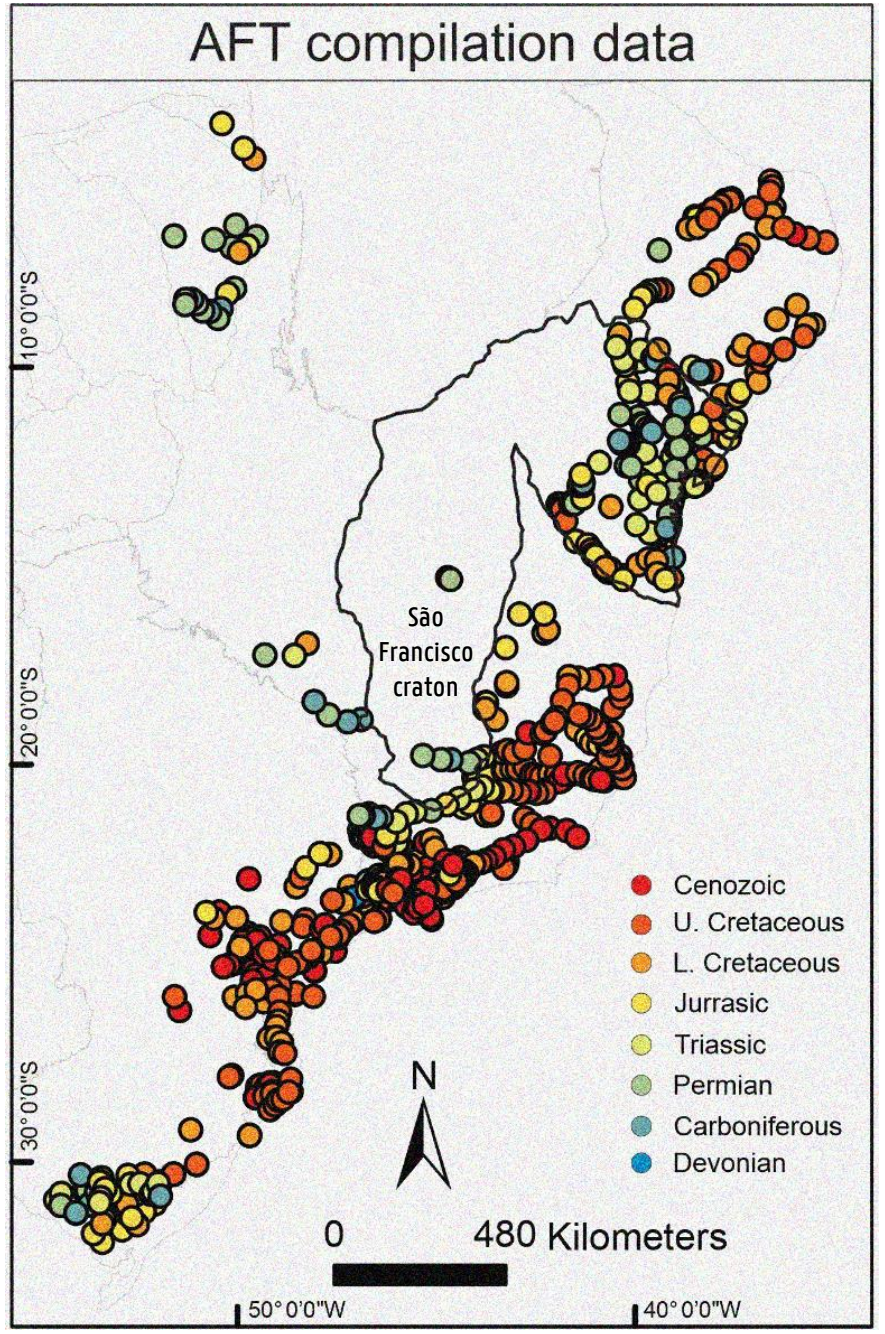

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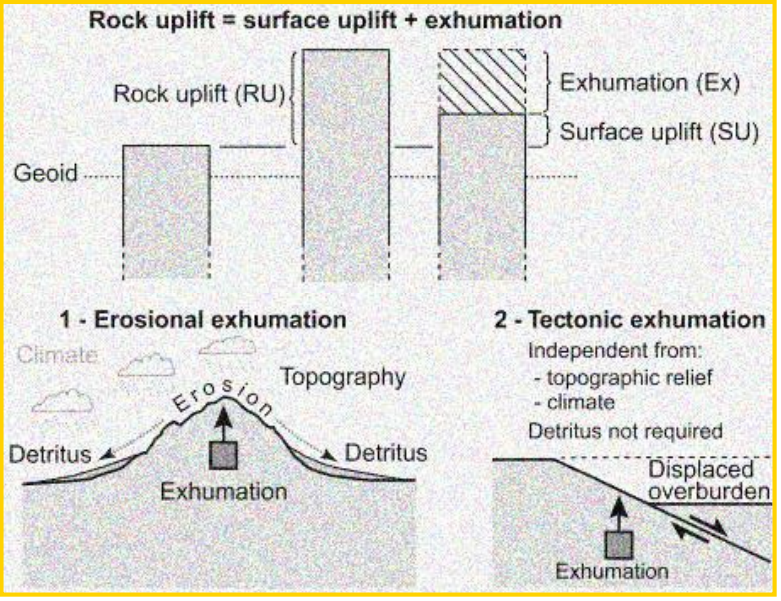

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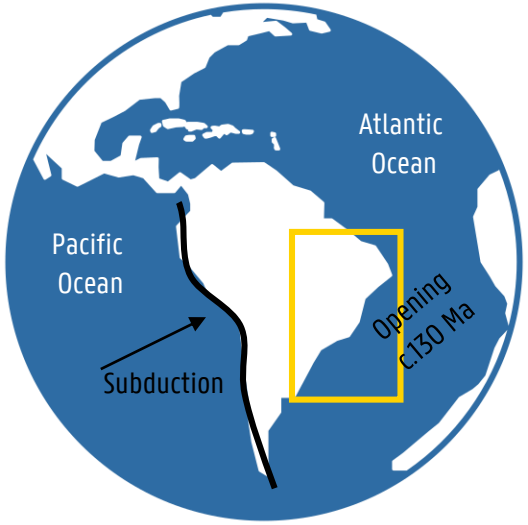

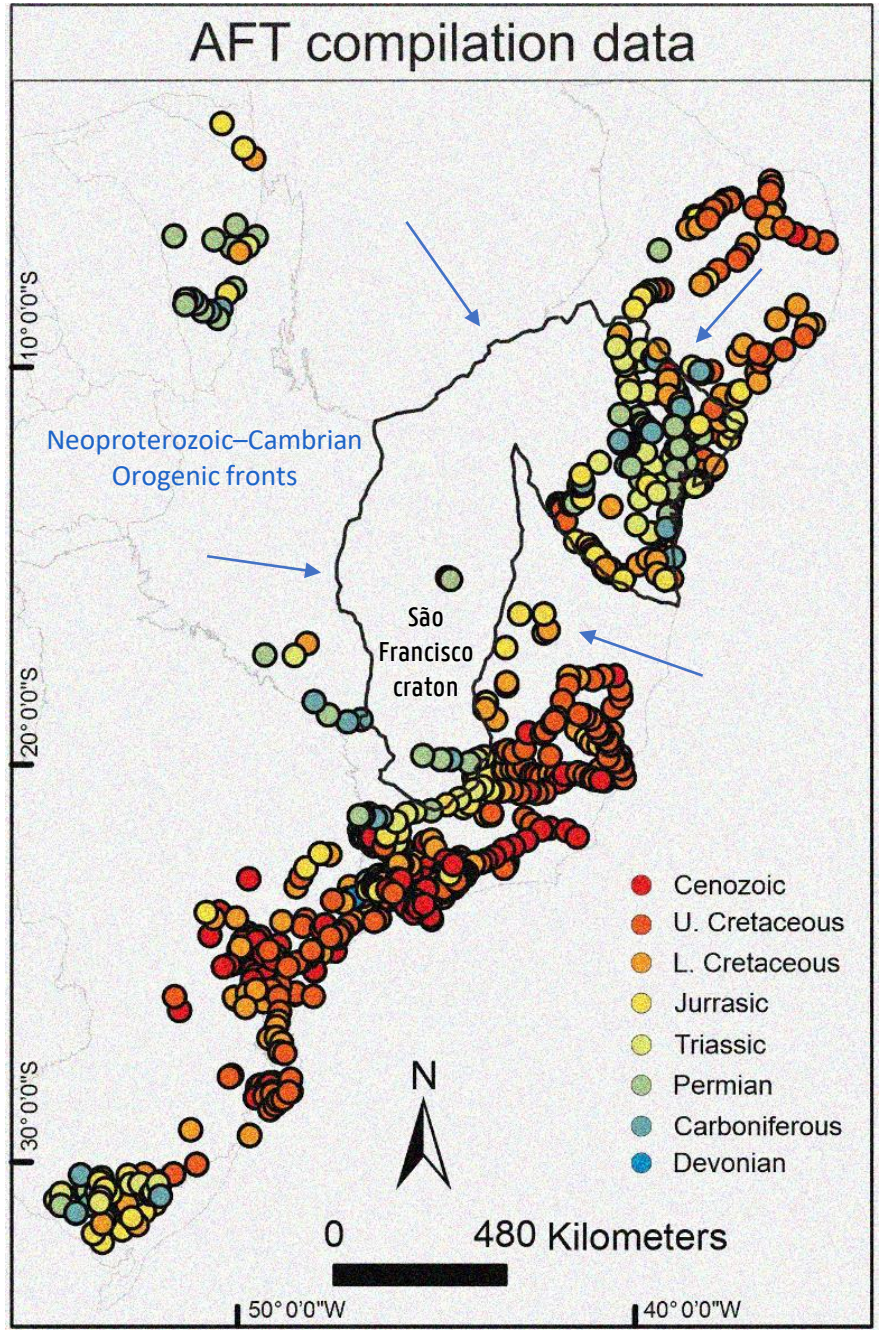

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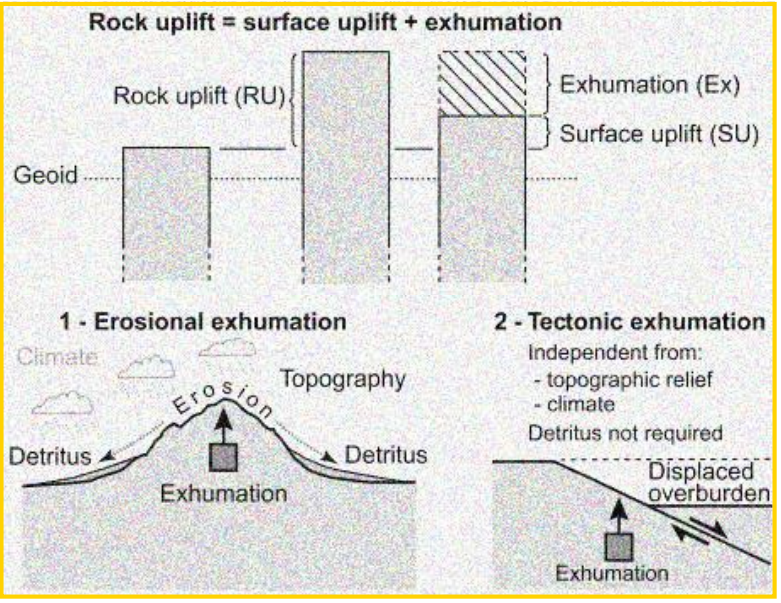

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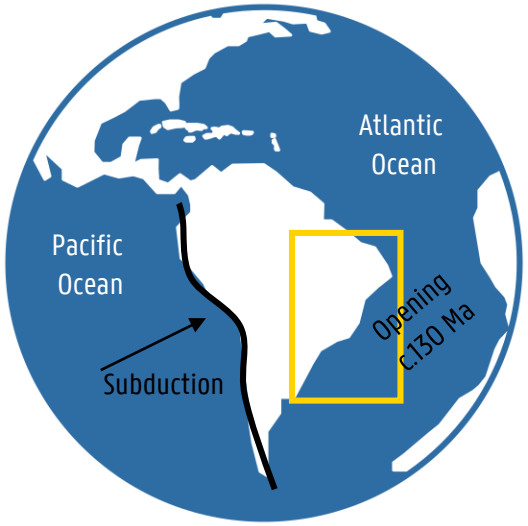

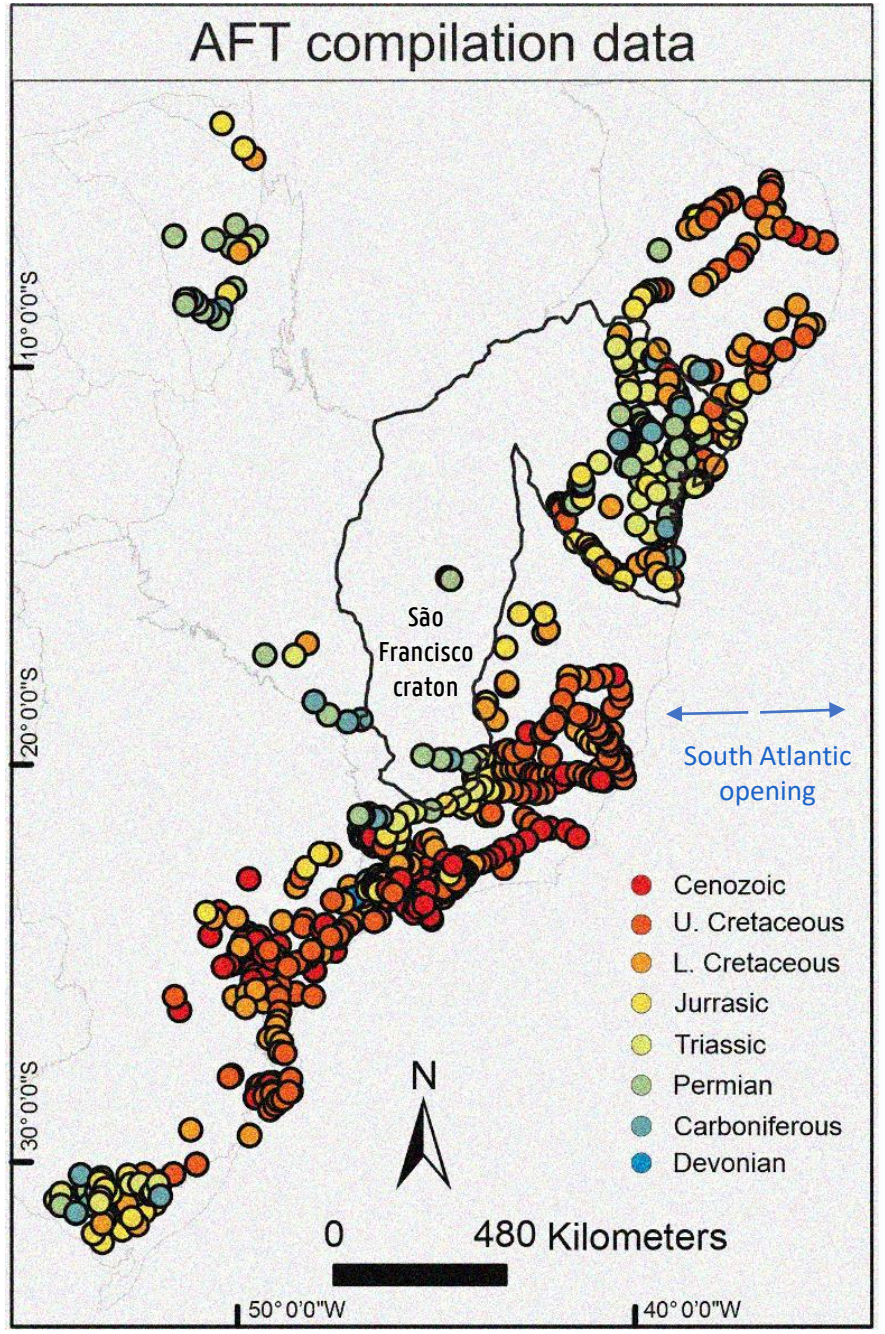

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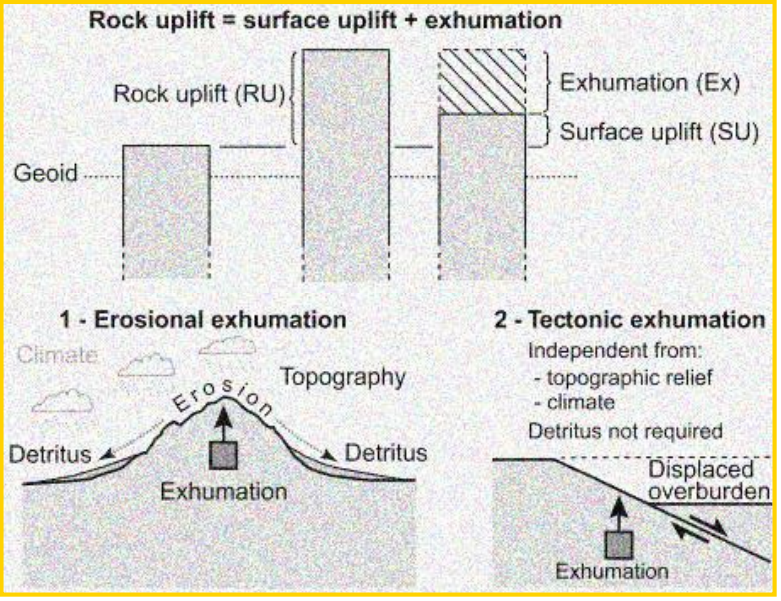

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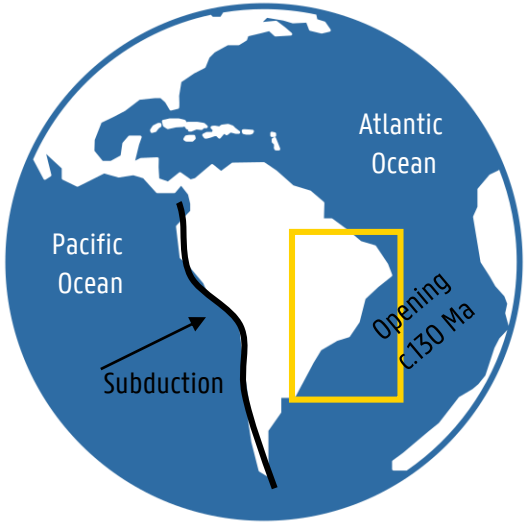

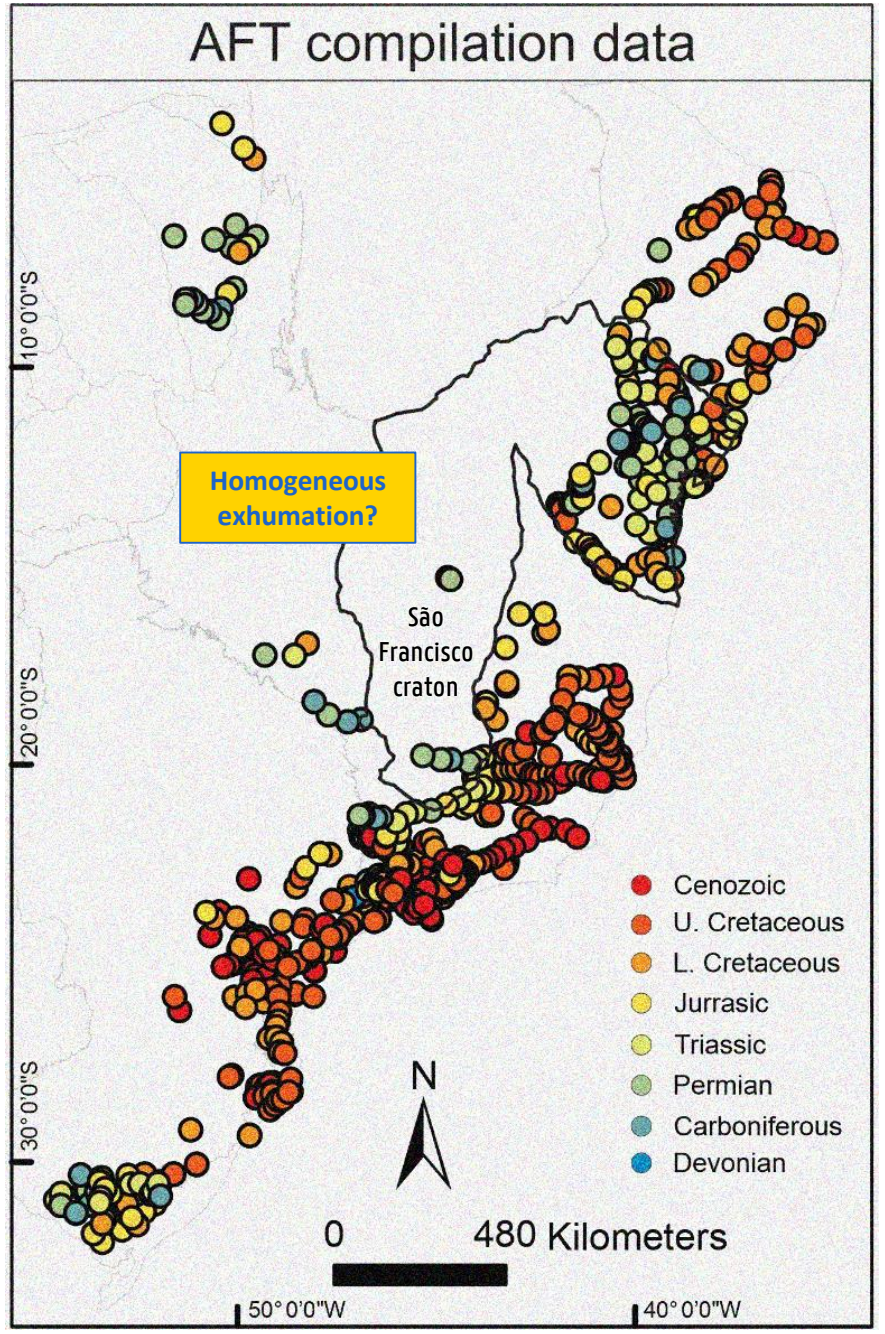

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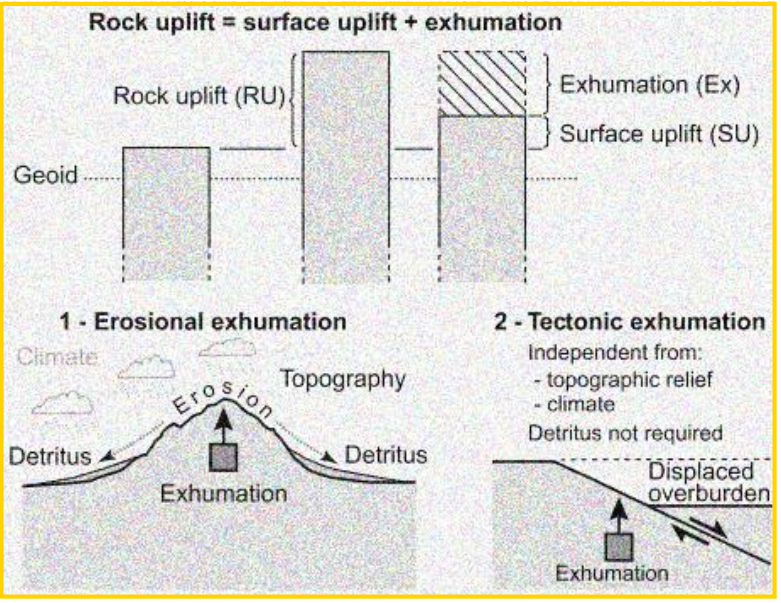

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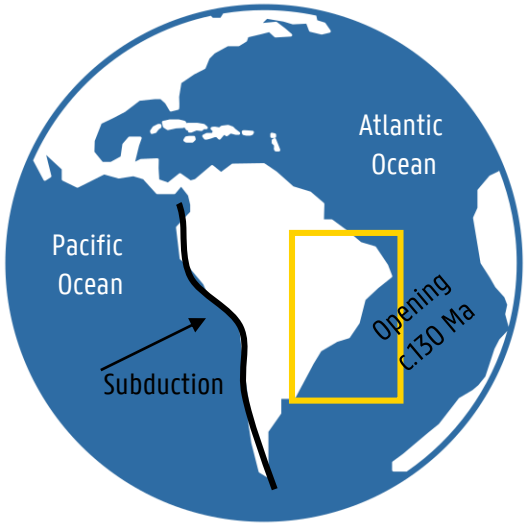

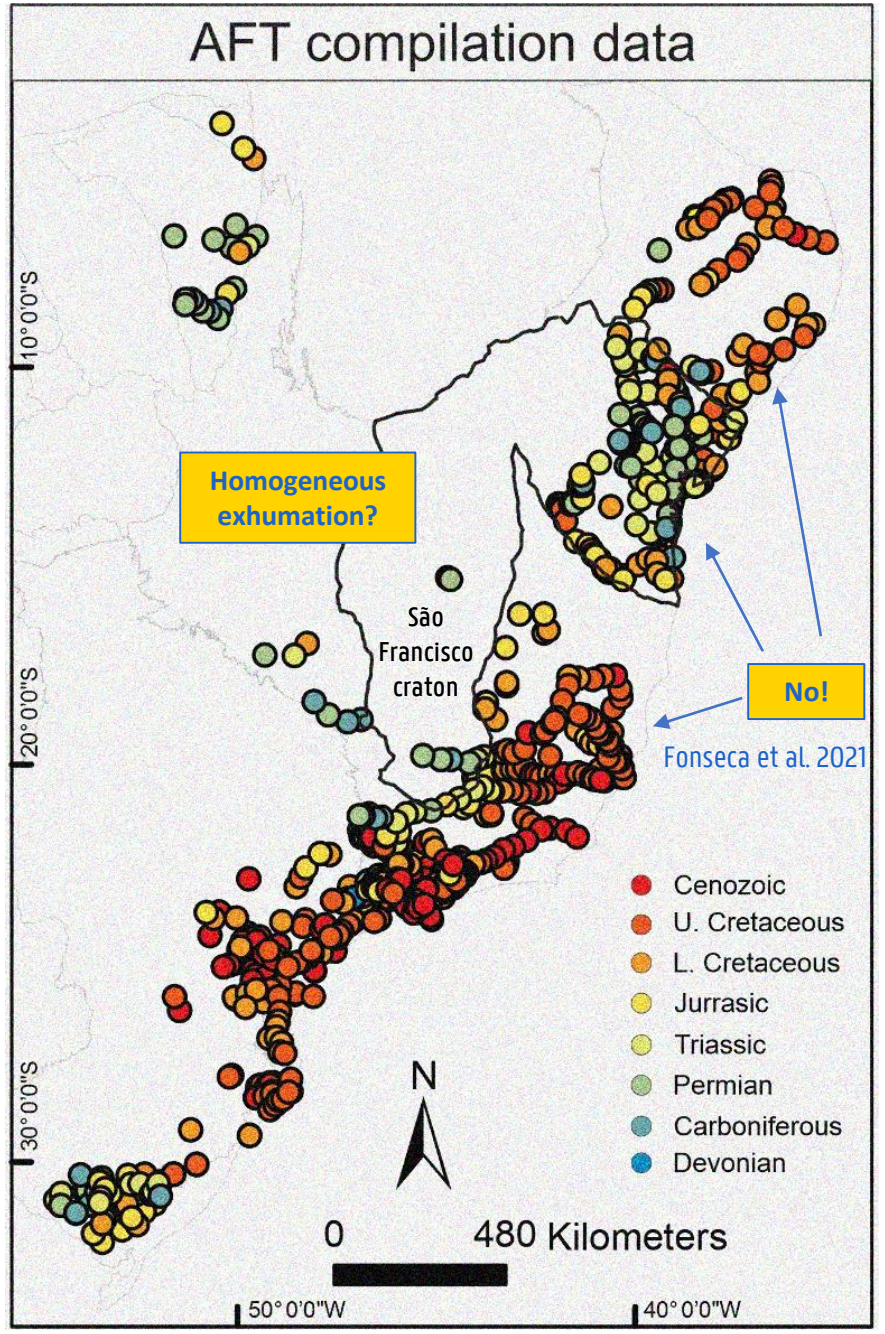

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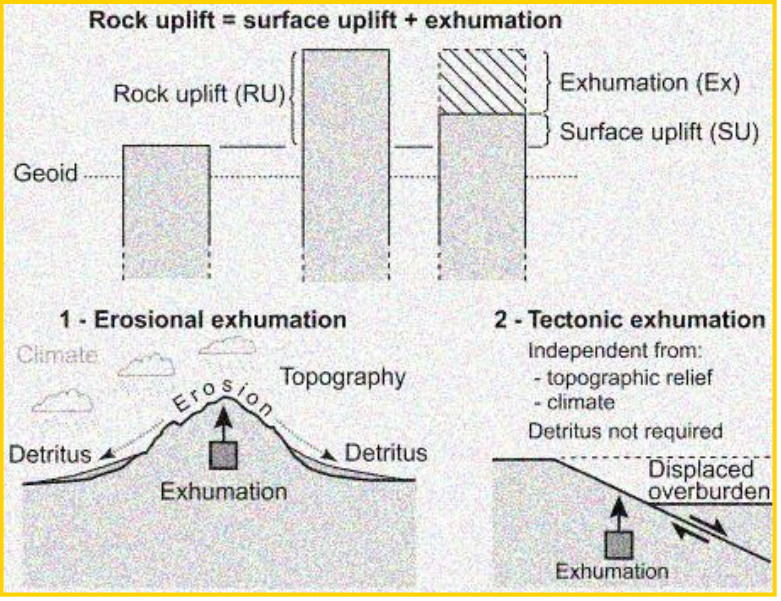

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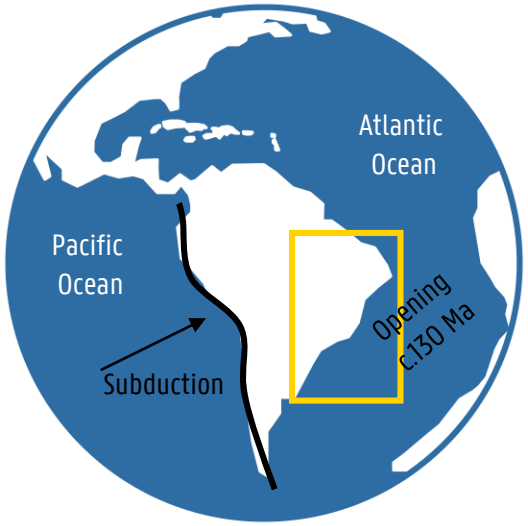

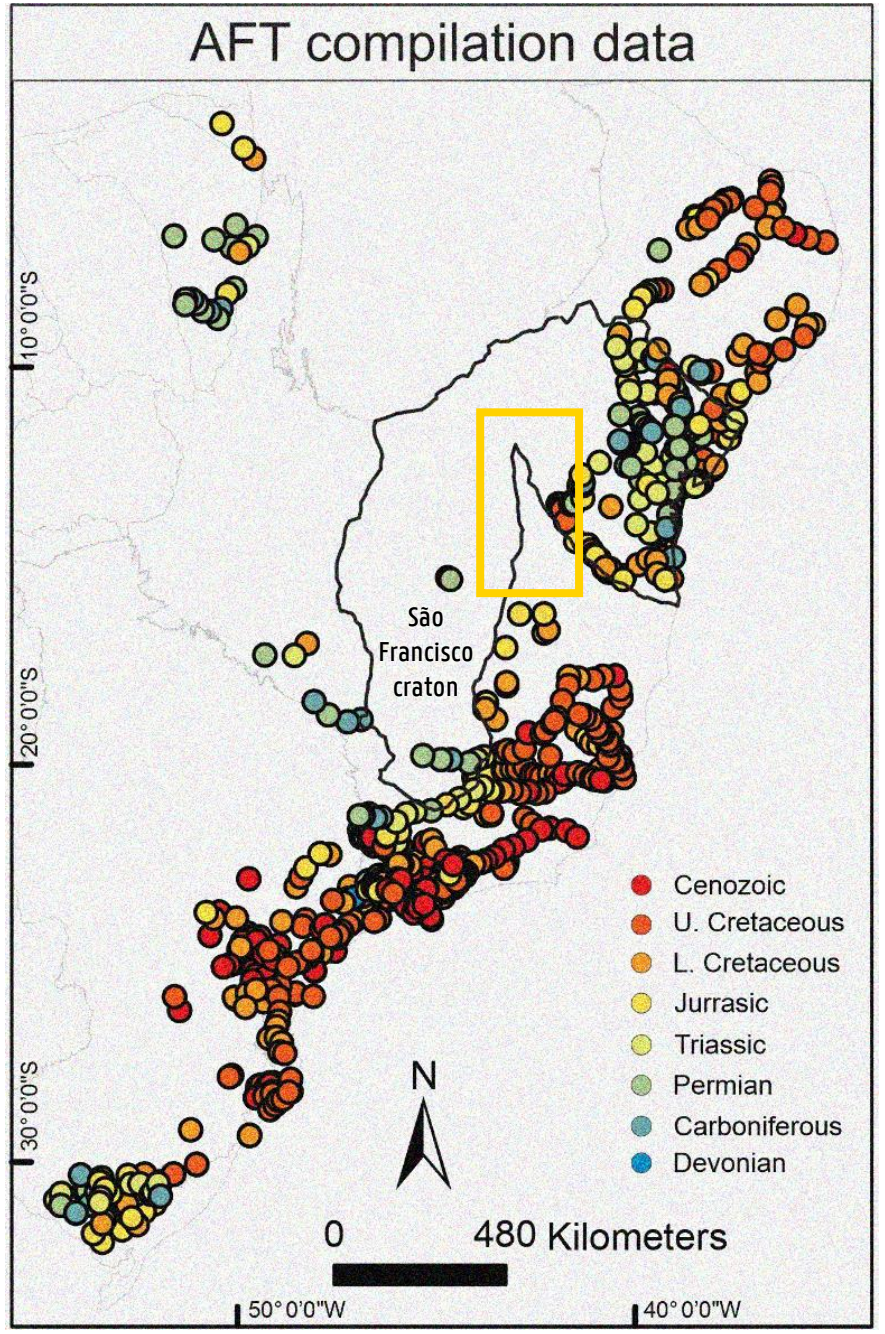

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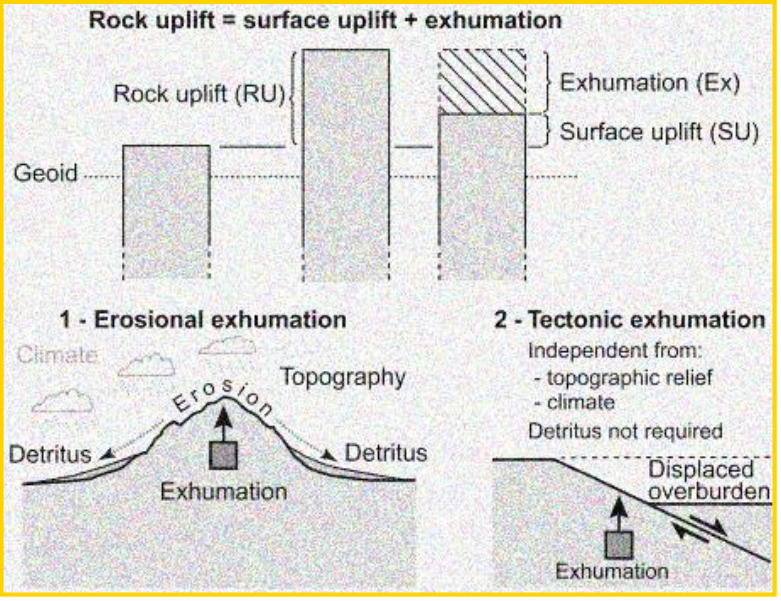

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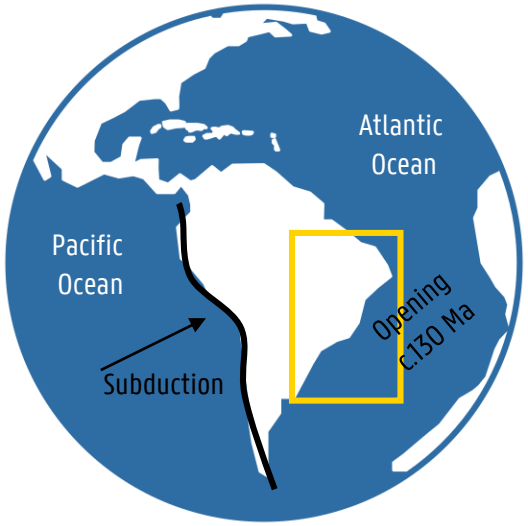

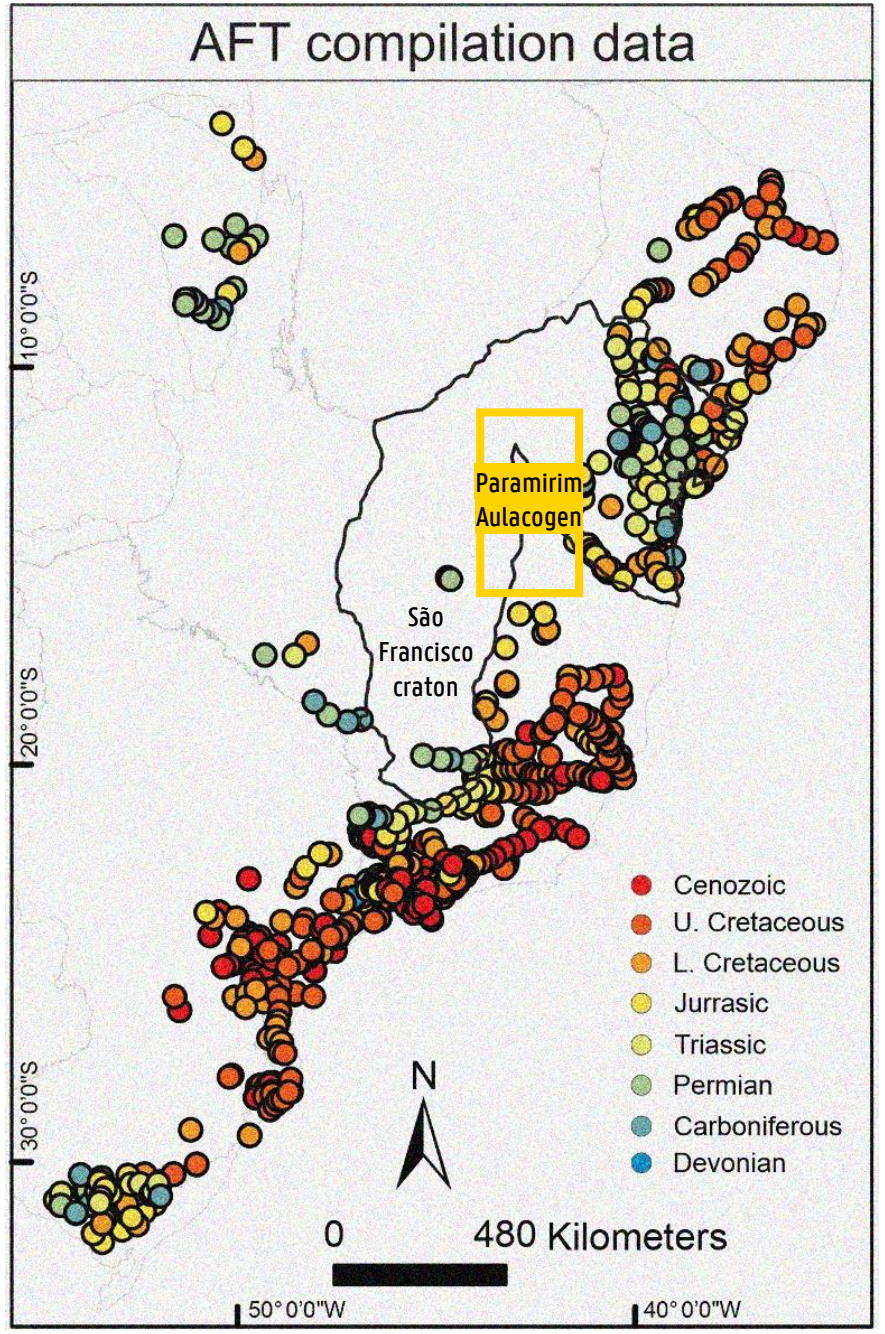

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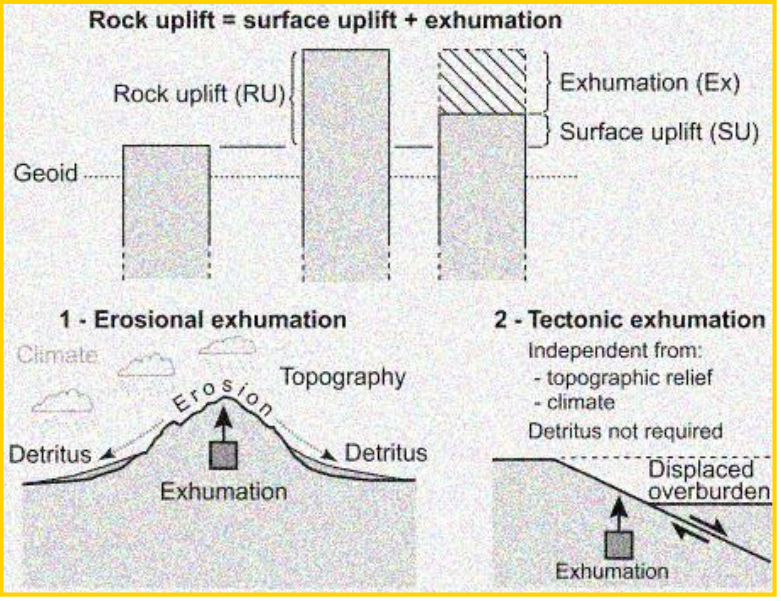

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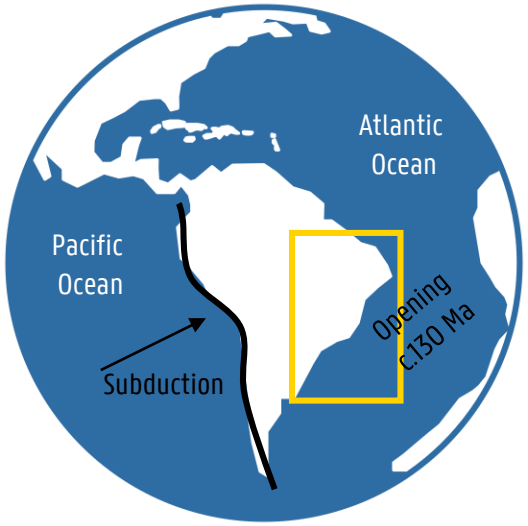
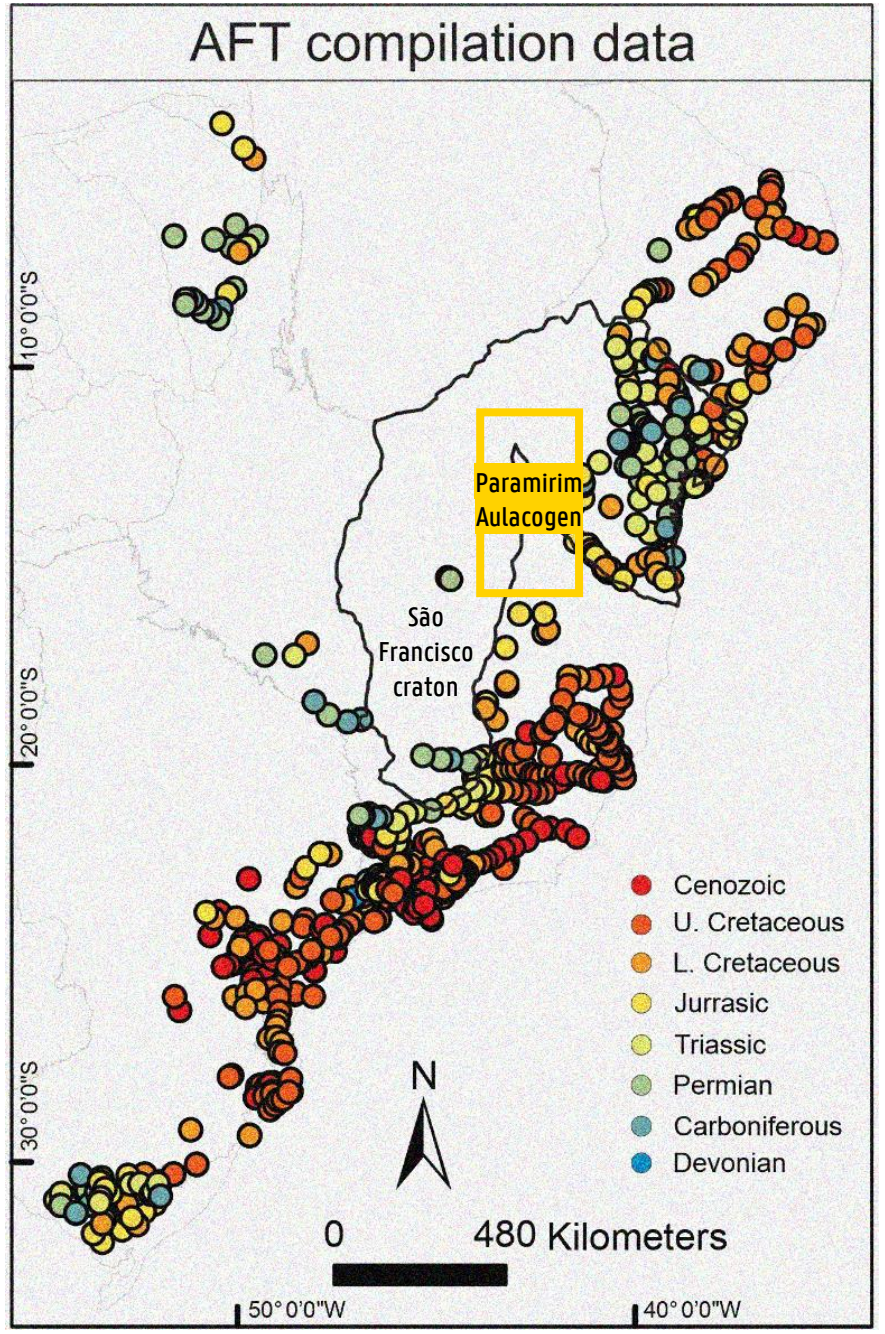
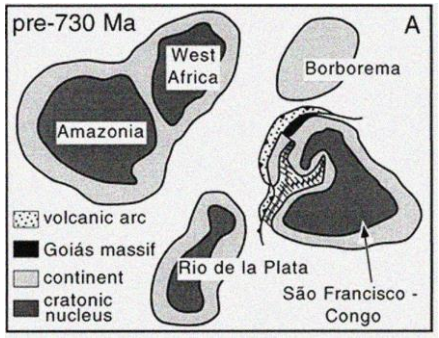


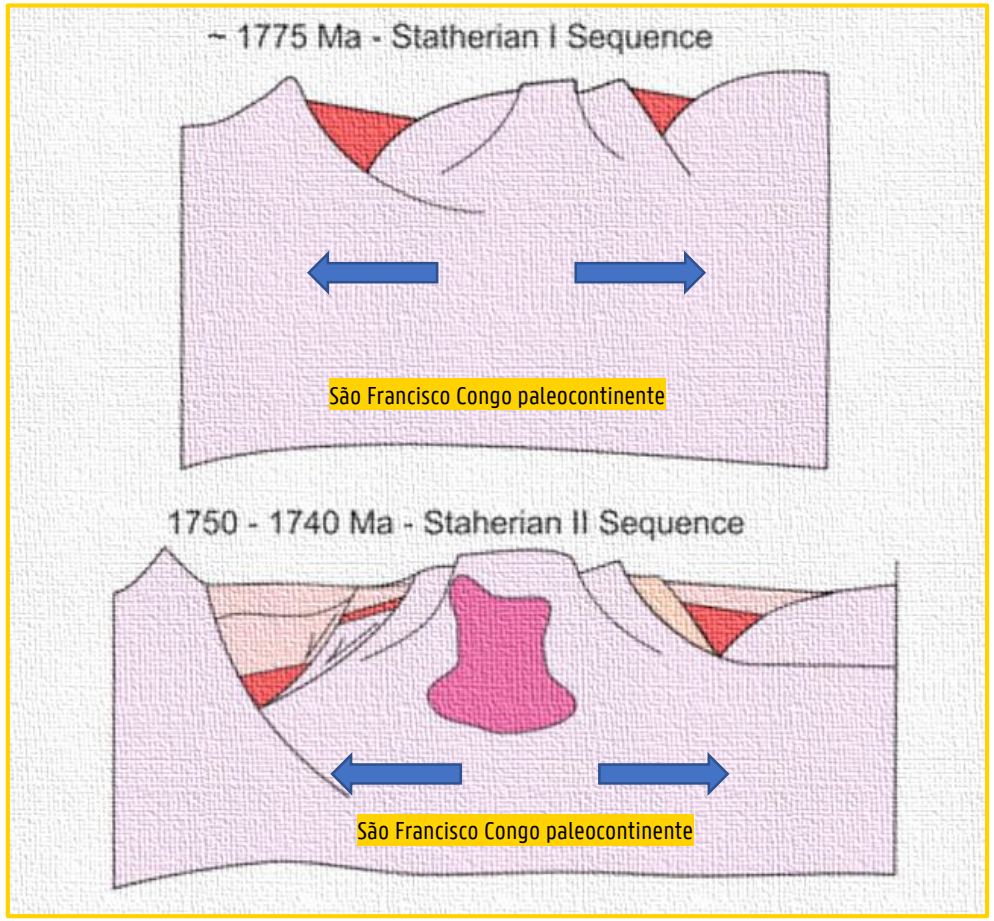


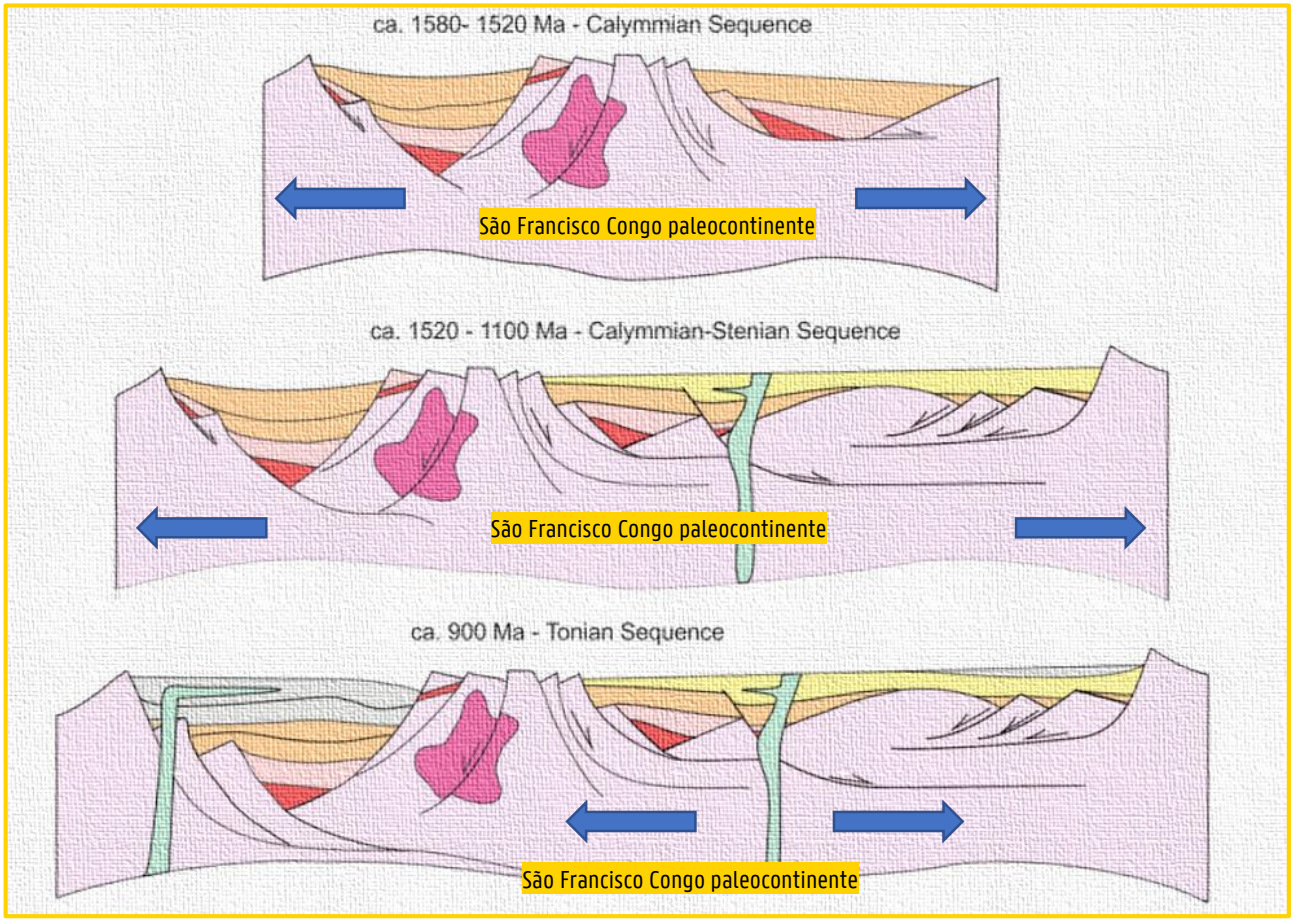
Paramirim Aulacogen (São Francisco craton)

Proterozoic rifting phase



Alkmin et al. (2001)





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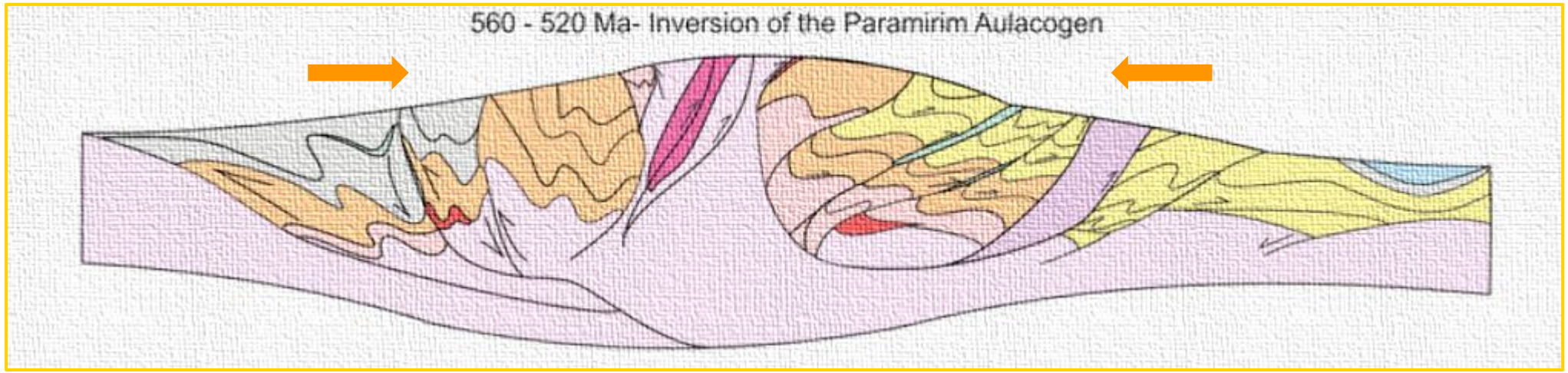
Neoproterozoic–early Cambrian inversion phase



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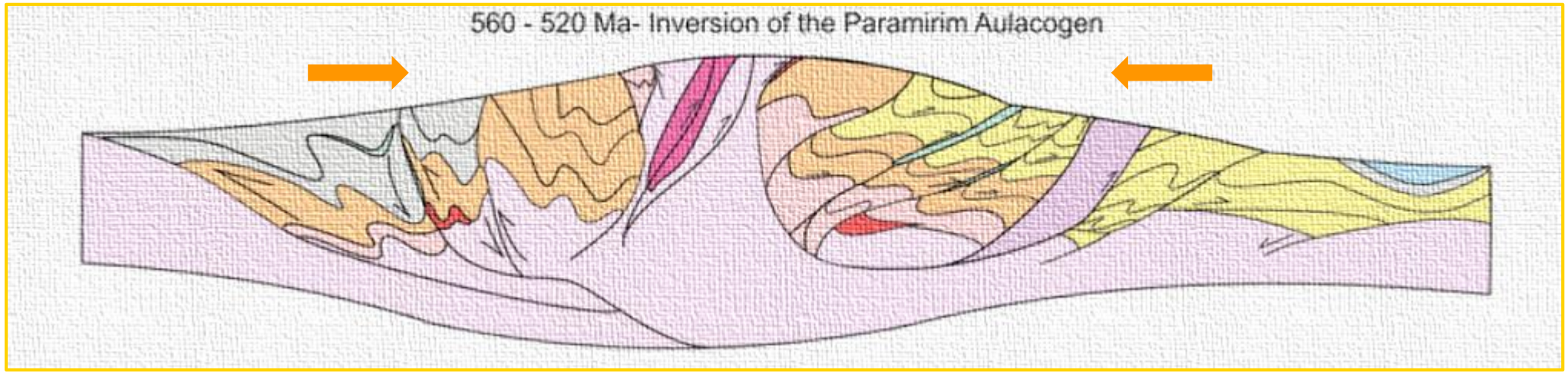

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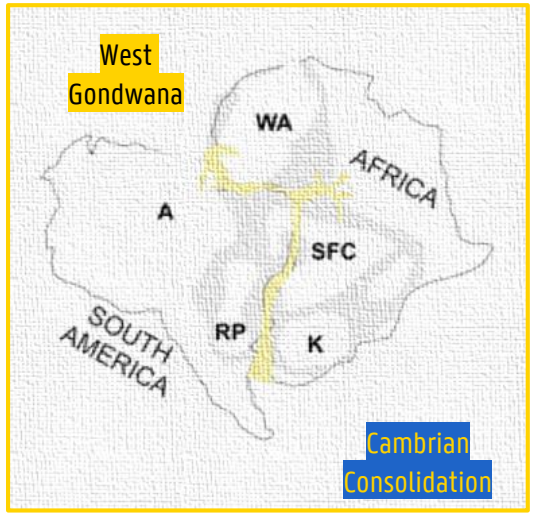

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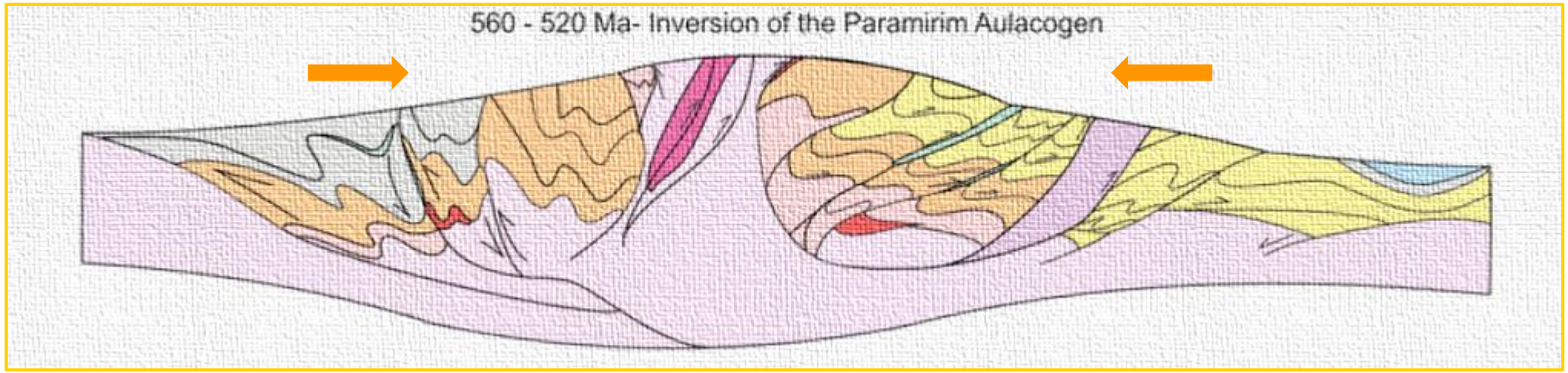

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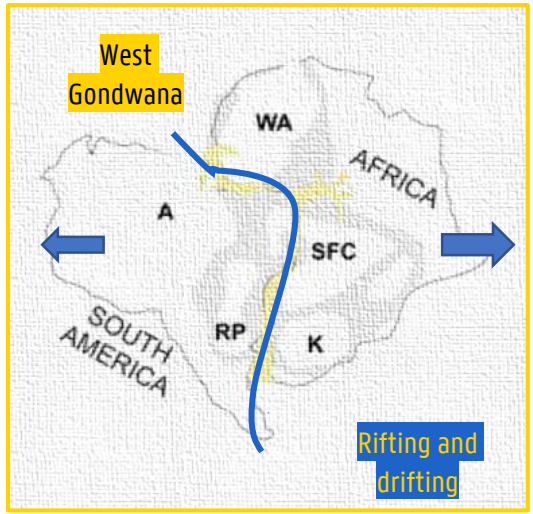

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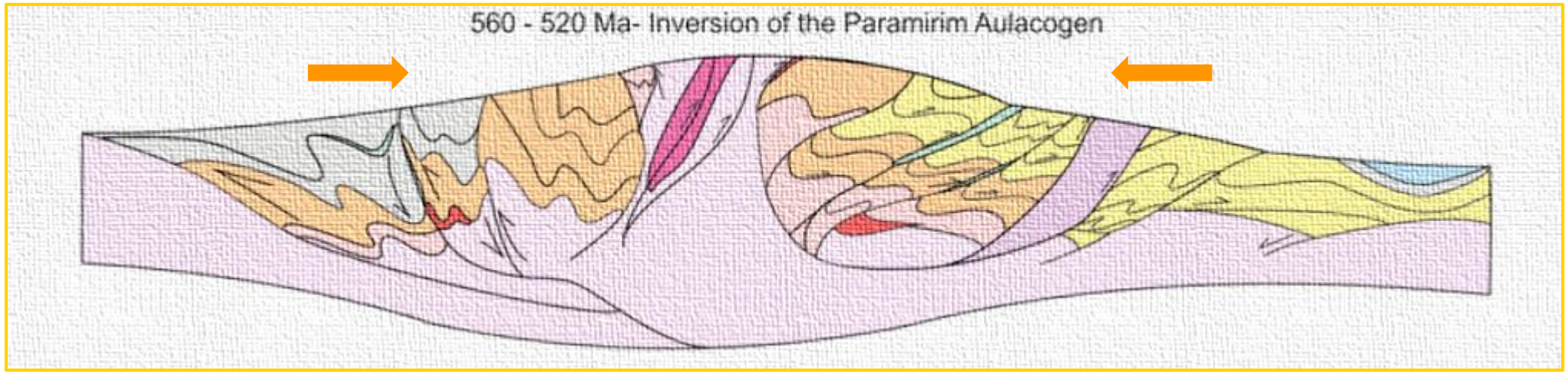

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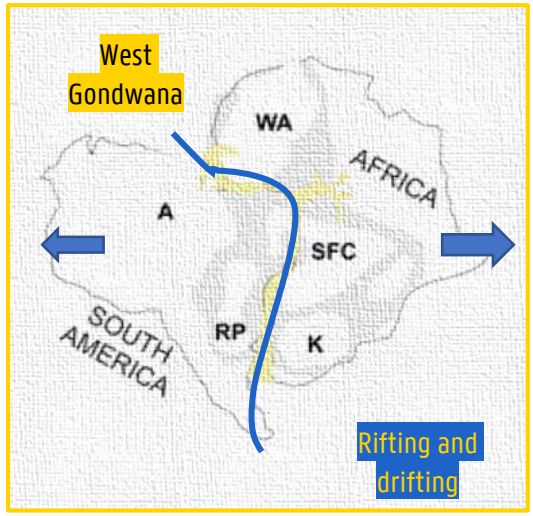


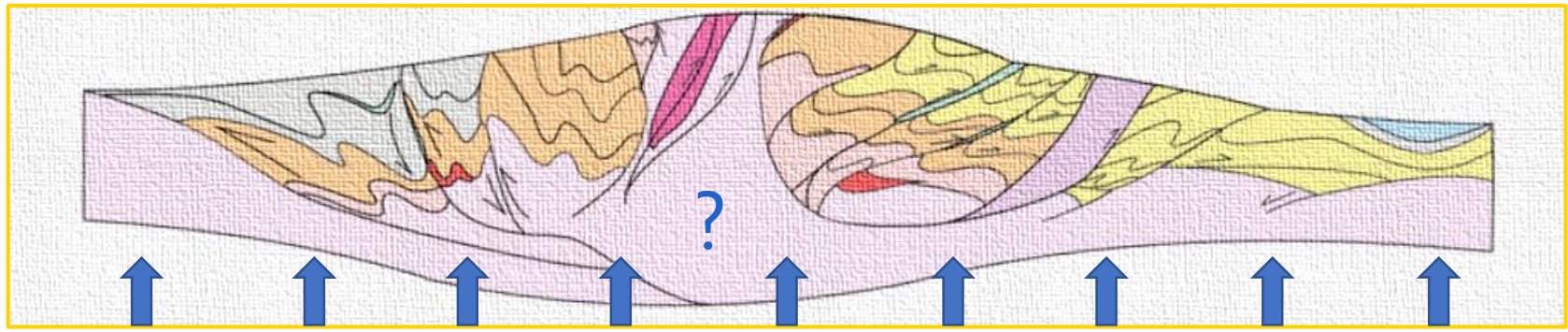
Craton

Not affected by inversion

Phanerozoic Exhumation

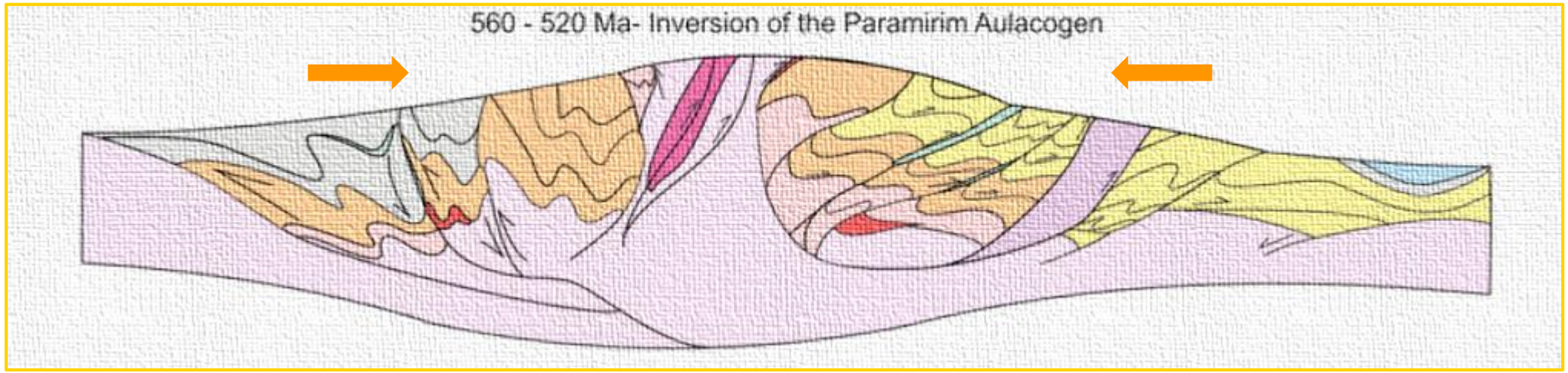
Intracontinental orogen

Craton

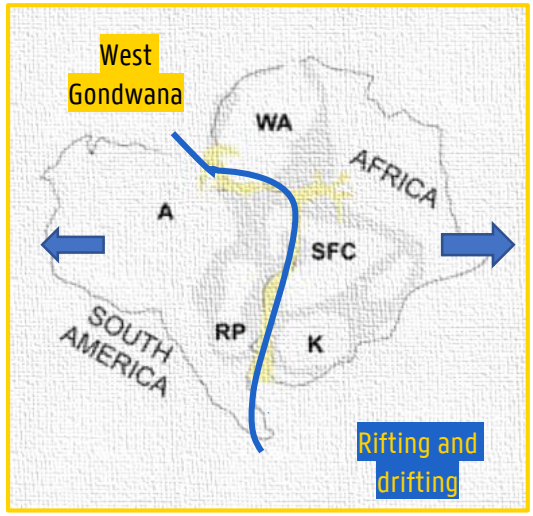


Paramirim Aulacogen (São Francisco craton)

Neoproterozoic–early Cambrian inversion phase



Cruz and Alkmin et al. (2017)



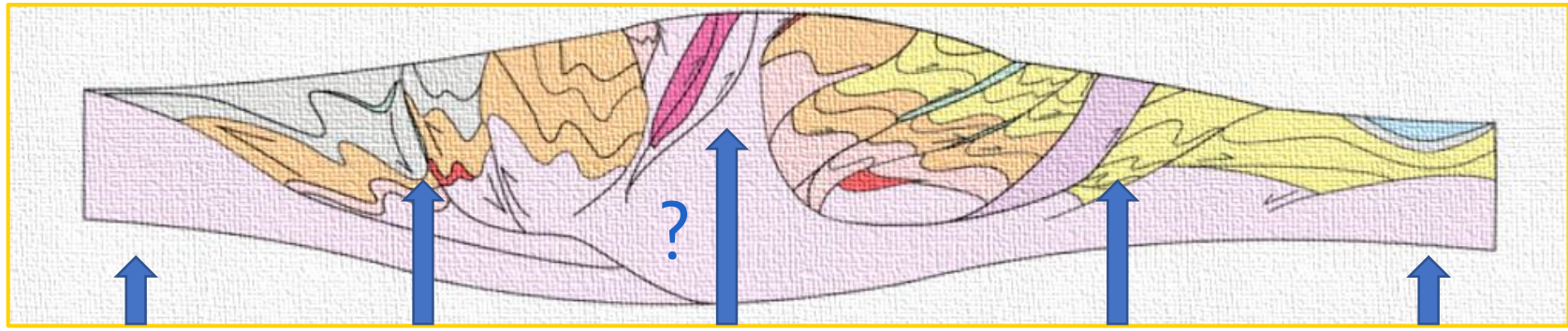
Craton

Not affected by inversion

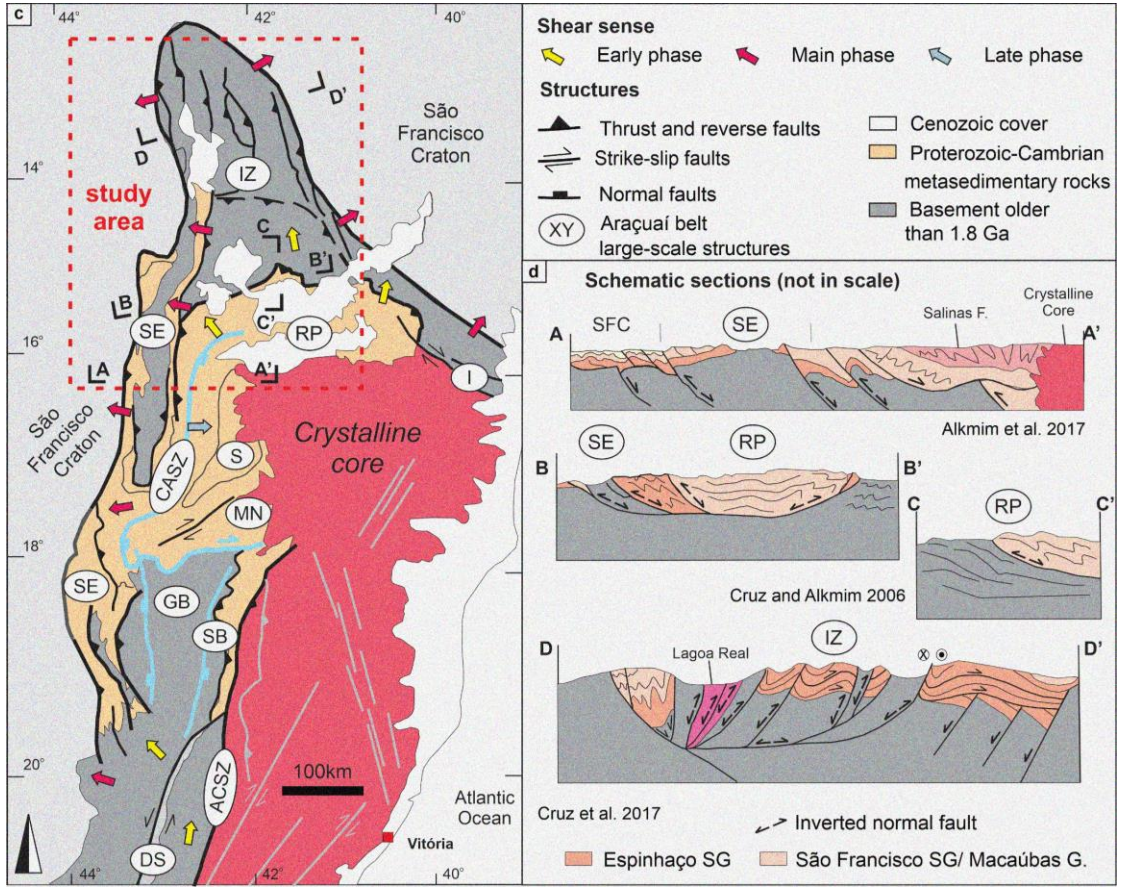
Phanerozoic Exhumation

Intracontinental orogen

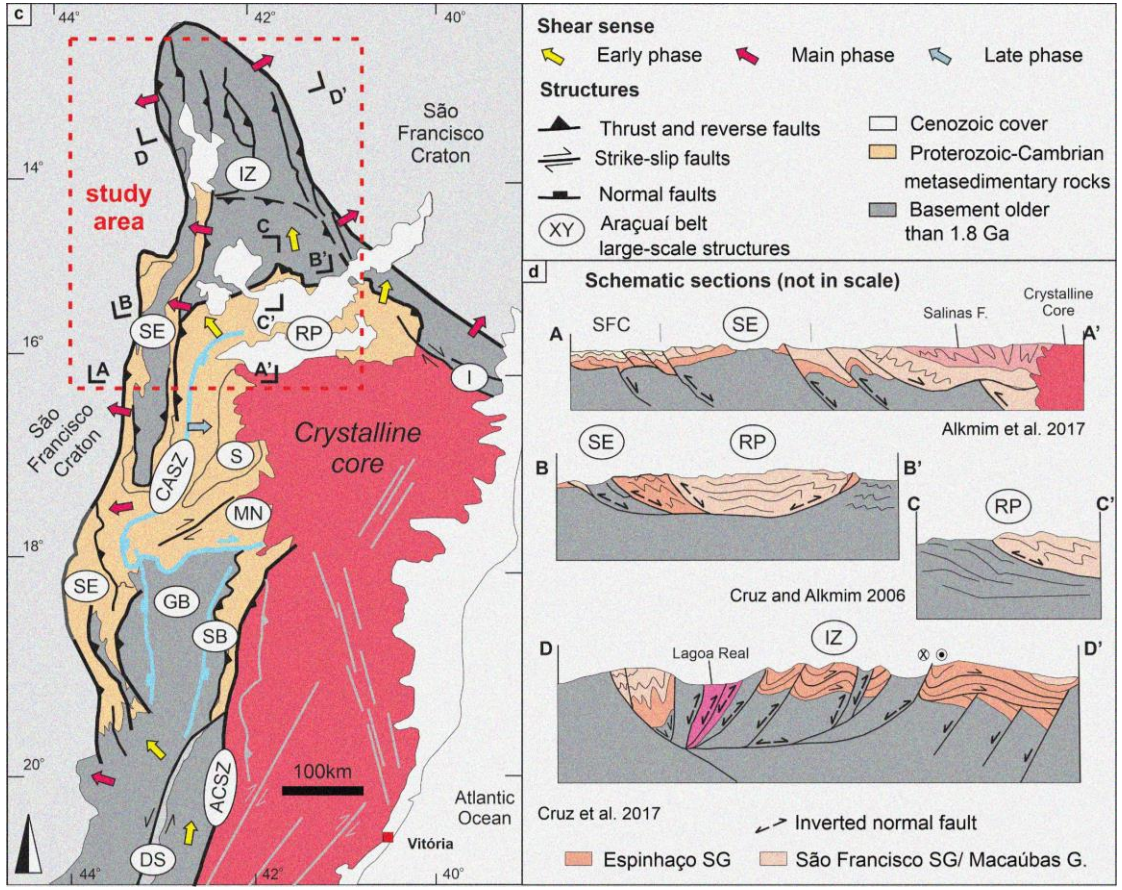
Craton

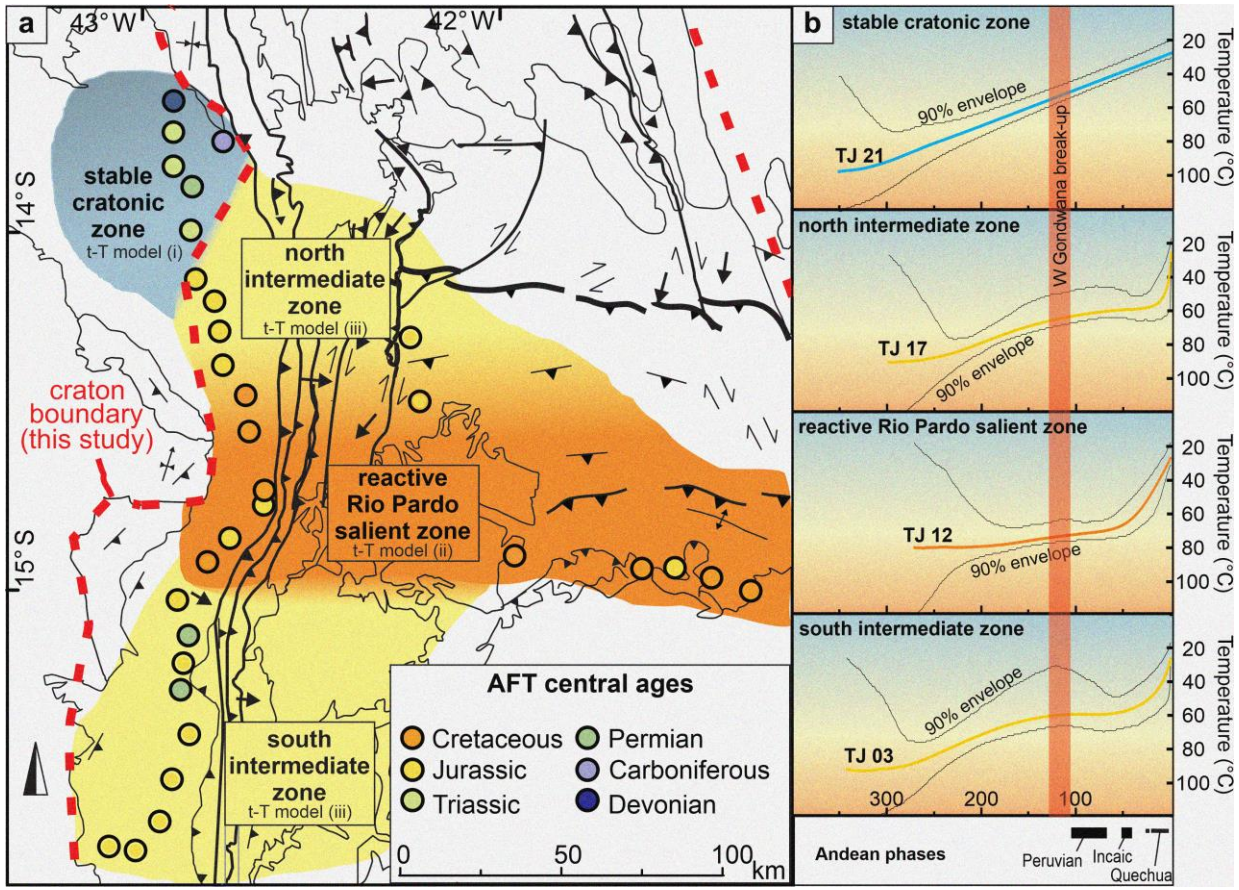


Paramirim Aulacogen (São Francisco craton)



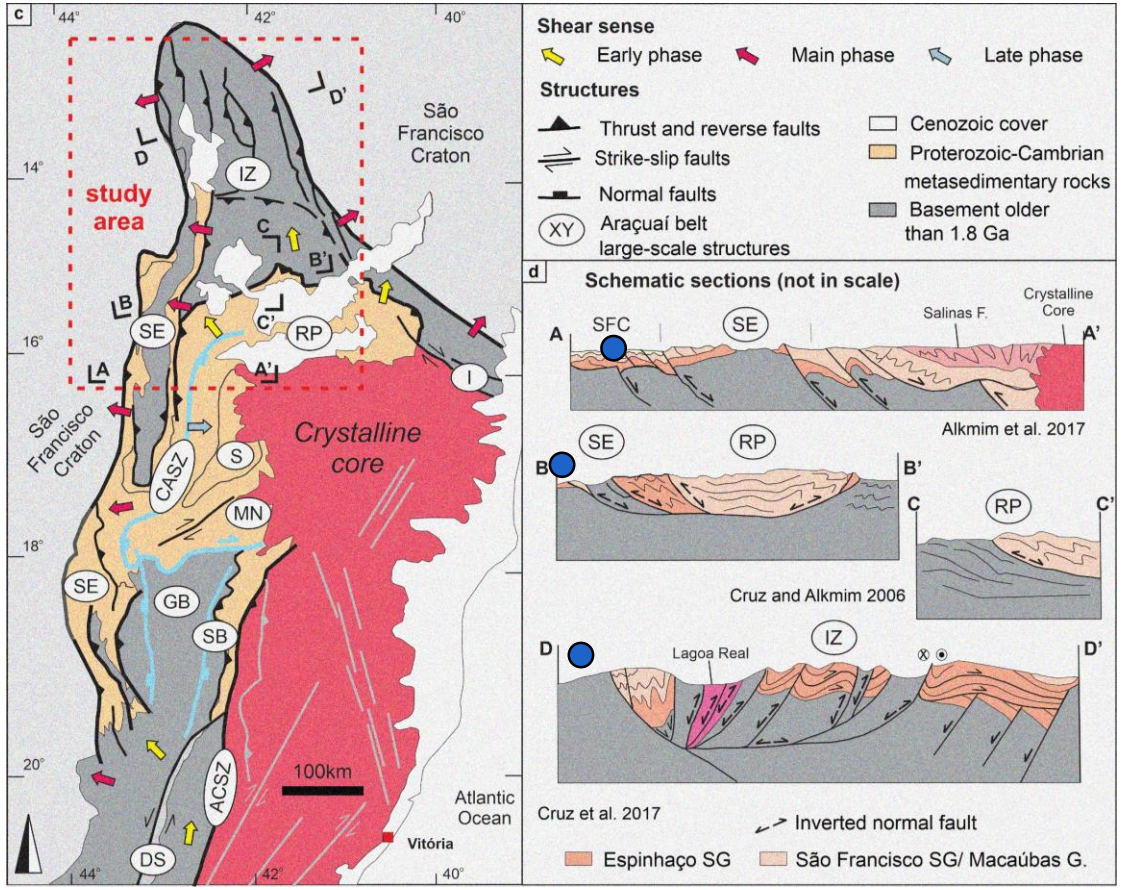
Paramirim Aulacogen (São Francisco craton)

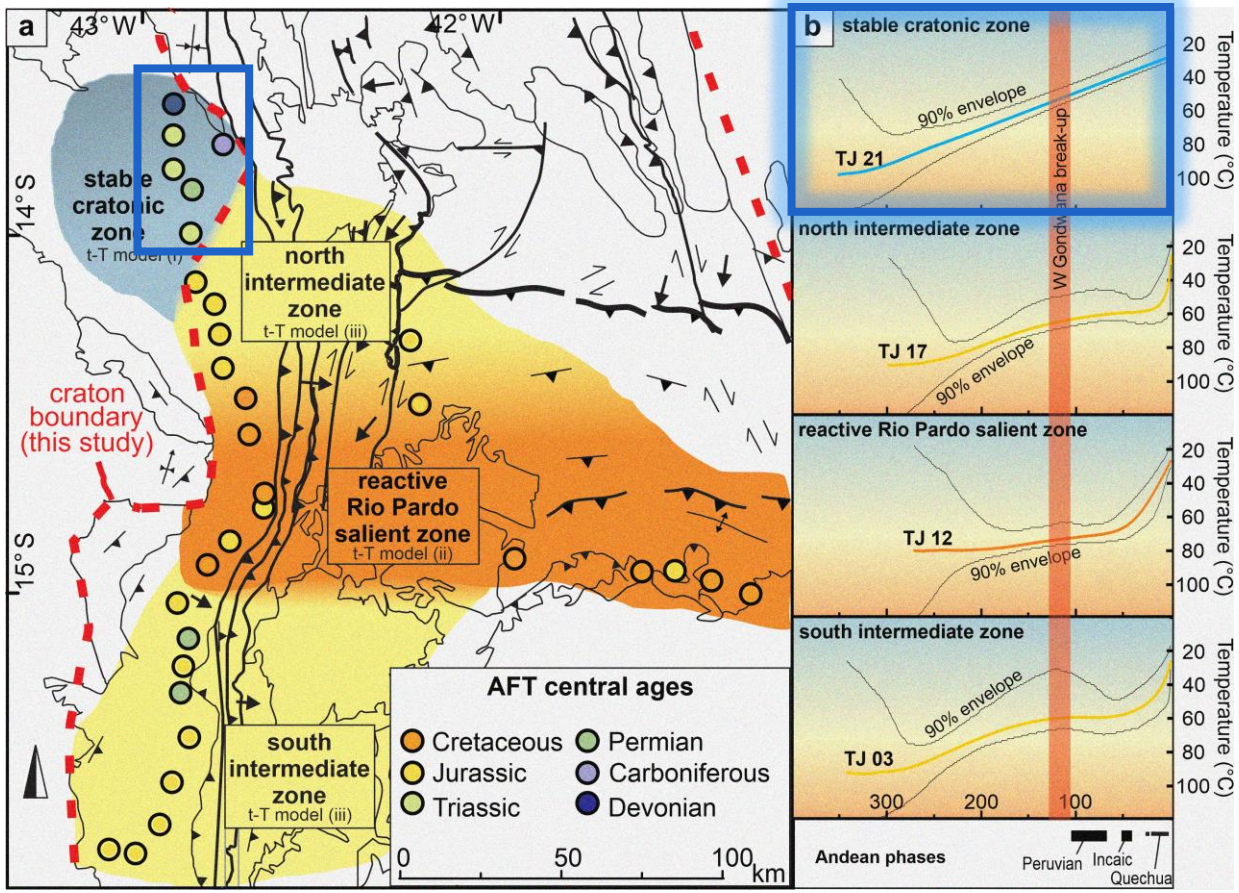




Paramirim Aulacogen (São Francisco craton)

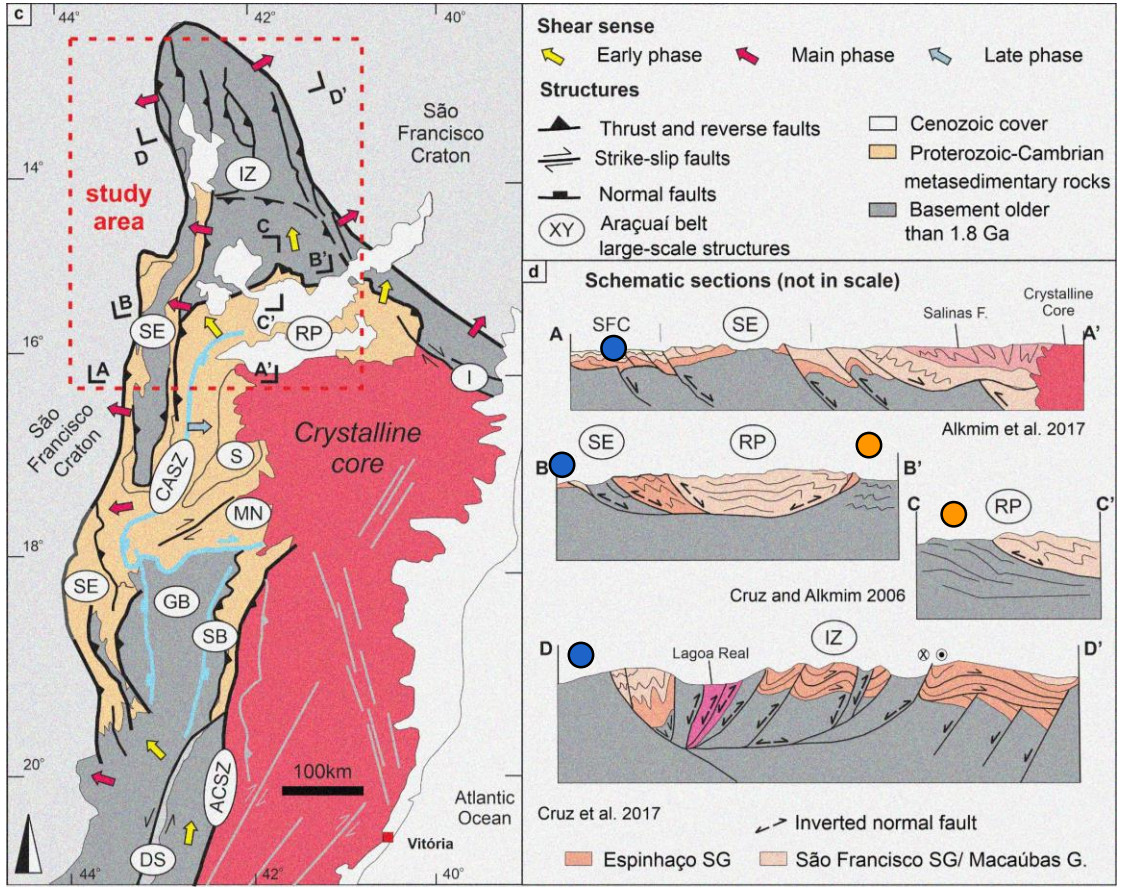
- To the north of our study area, thermal history modelling of the basement rocks exhibits slow and protracted cooling during the Phanerozoic, consistent with the rigid cratonic lithosphere of the São Francisco Craton.

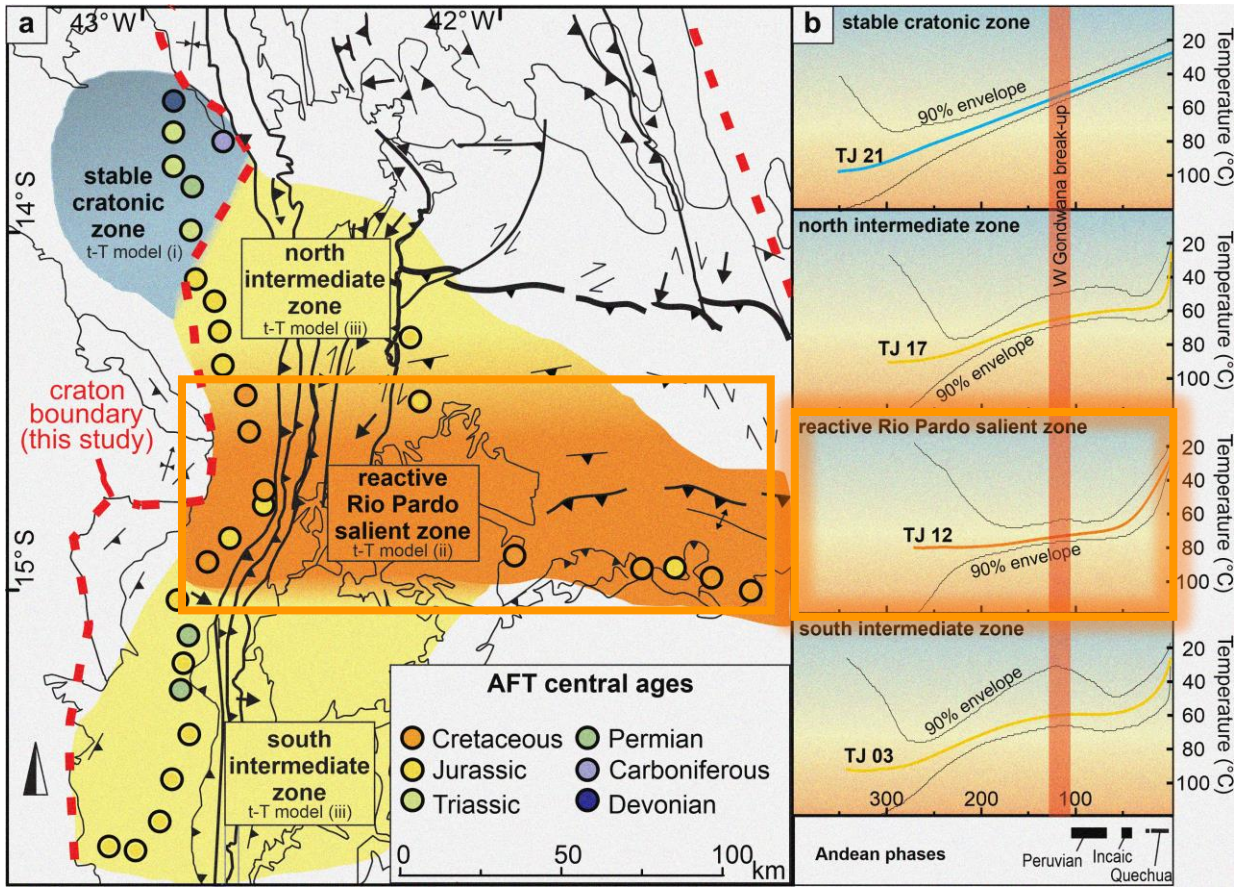




Paramirim Aulacogen (São Francisco craton)

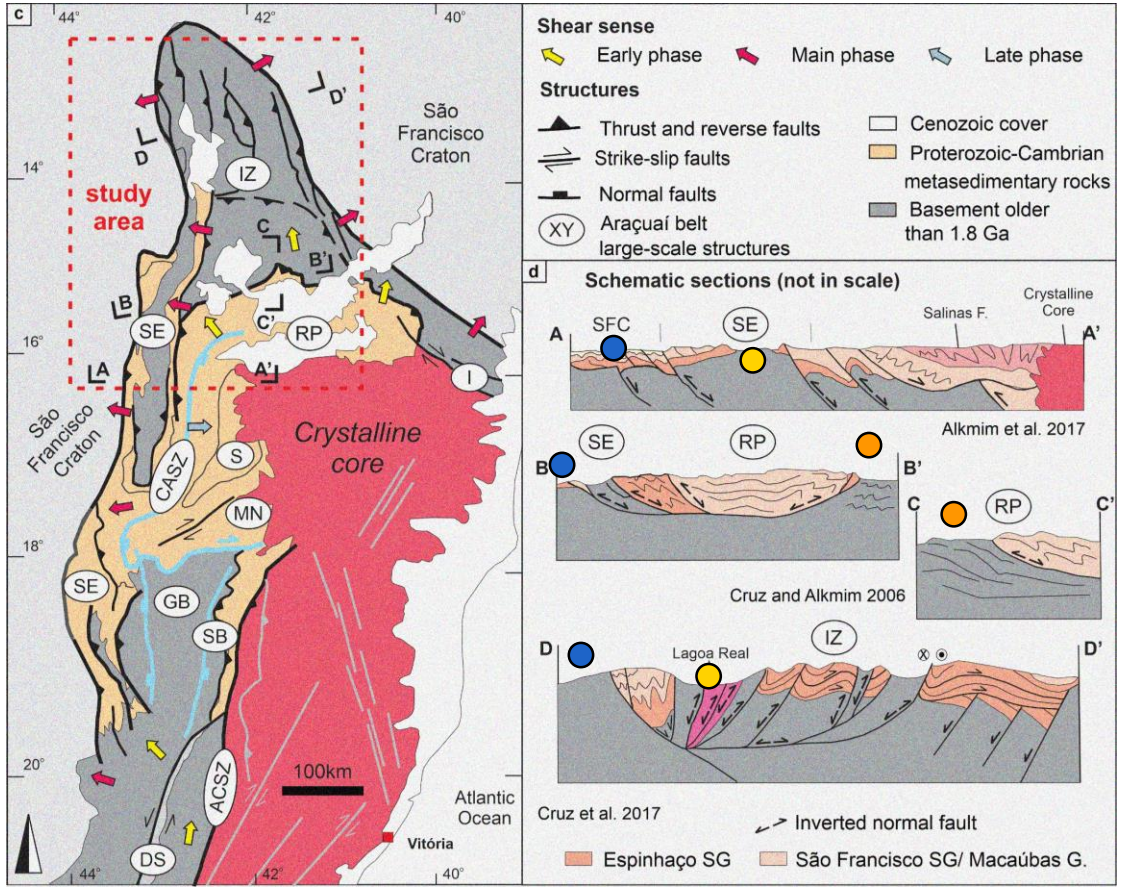
- Samples from the Araçuaí belt, in the interior of the Paramirim aulacogen, display reactivation during the Cenozoic, mainly between the Eocene to present, reflecting its weakened lithosphere, inherited from the Ediacaran–Cambrian collision.

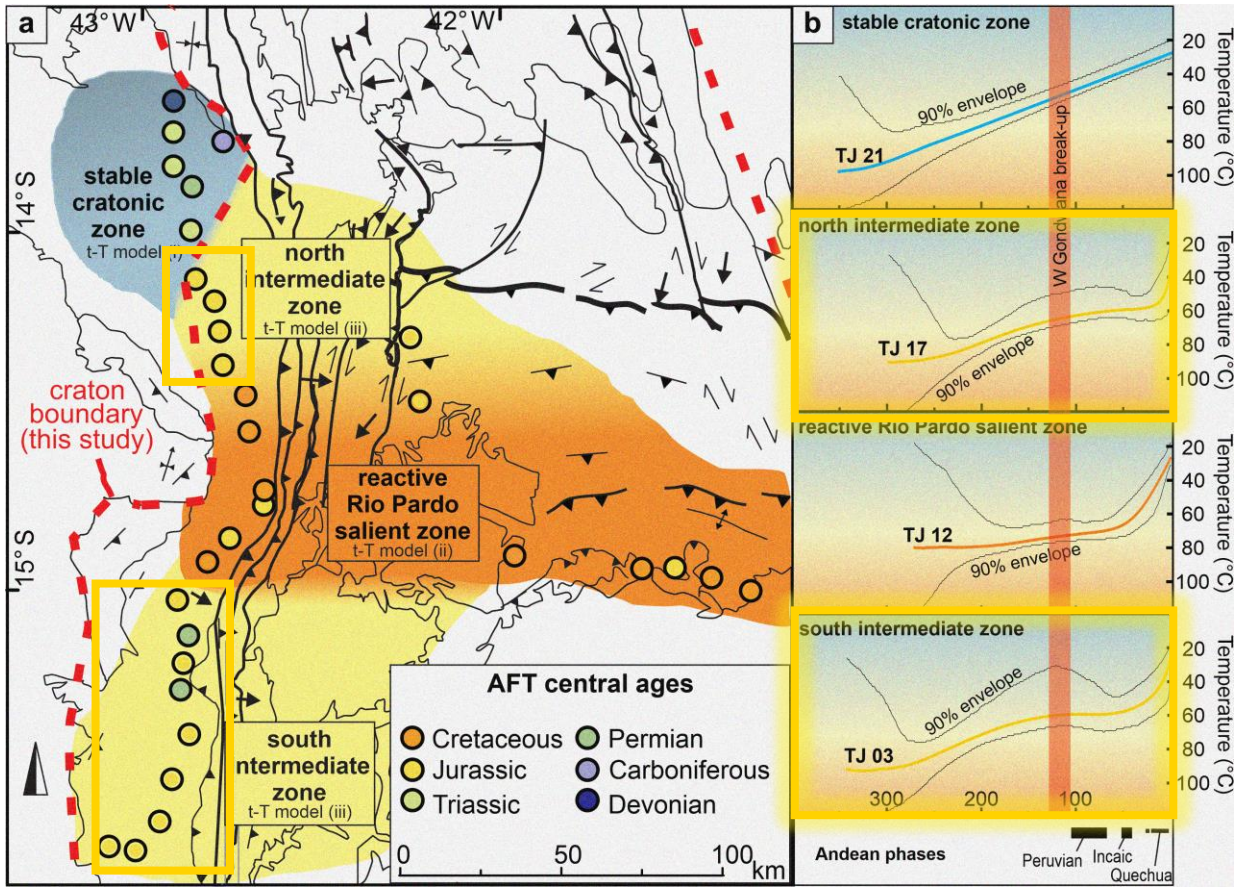




Paramirim Aulacogen (São Francisco craton)

- An intermediate zone is identified, and it is considered mostly part of the Araçuaí Belt but with less penetrative deformation as to the orogen proper.





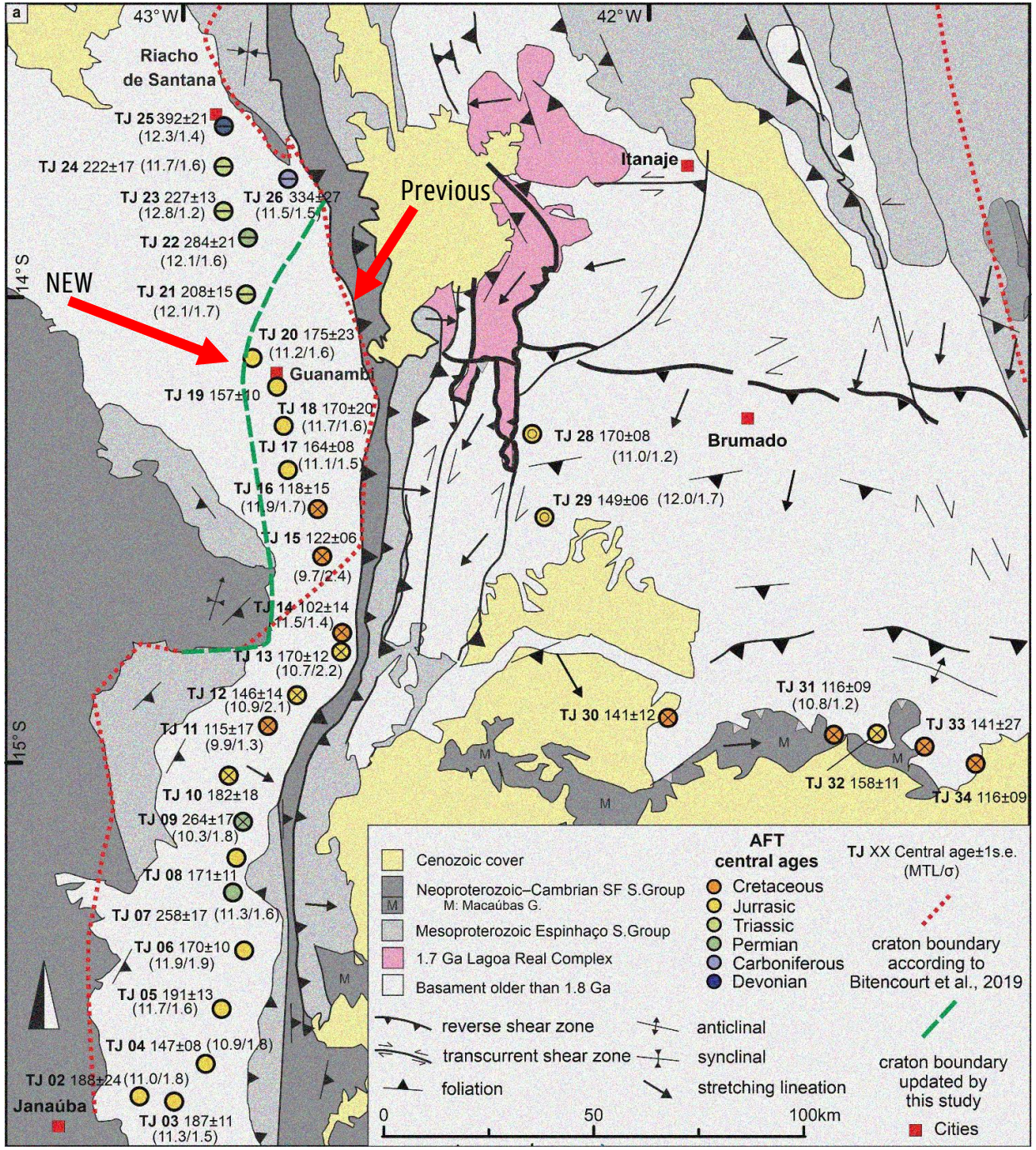
Conclusions

- AFT data from the São Francisco craton and adjoining Araçuaí belt in the Paramirim Aulacogen area (eastern Brazil) elucidate the differential behavior of the cratonic and non-cratonic lithosphere during the Phanerozoic exhumation of this region.

- The thermochronological data proved to be highly useful in determining the decreasing magnitude of reactivation along the craton—orogen boundary

and

- can be used as a tool to trace and distinguish cratonic areas weakened by later deformation events.



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