

The Parnaíba Basin WARR, Brazil (“PABIP”)

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Background and purpose

The Parnaíba Basin is an intracontinental Palaeozoic sag basin, roughly circular in shape, occupying a 660,000 km² area of northern Brazil. It is in tectonic contact with the Amazon and São Luis cratons to the west and north respectively. It has an erosive contact to the east and south, overlying the Borborema and São Francisco Craton-Tocantins provinces respectively. The covered basement of the Parnaíba Basin, near its eastern border, is cut by the Transbrasiliano lineament. In order to detail the architecture of the Parnaíba Basin and its basement and to better understand the genesis of intracontinental basins, BP promoted a multidisciplinary research programme on the Parnaíba Basin called PABIP that involves partnerships between Brazilian and British universities and other organisations. The Parnaíba WARR (Wide Angle Reflection and Refraction) profile is one element of a number of geological, geochemical and geophysical studies comprising PABIP.

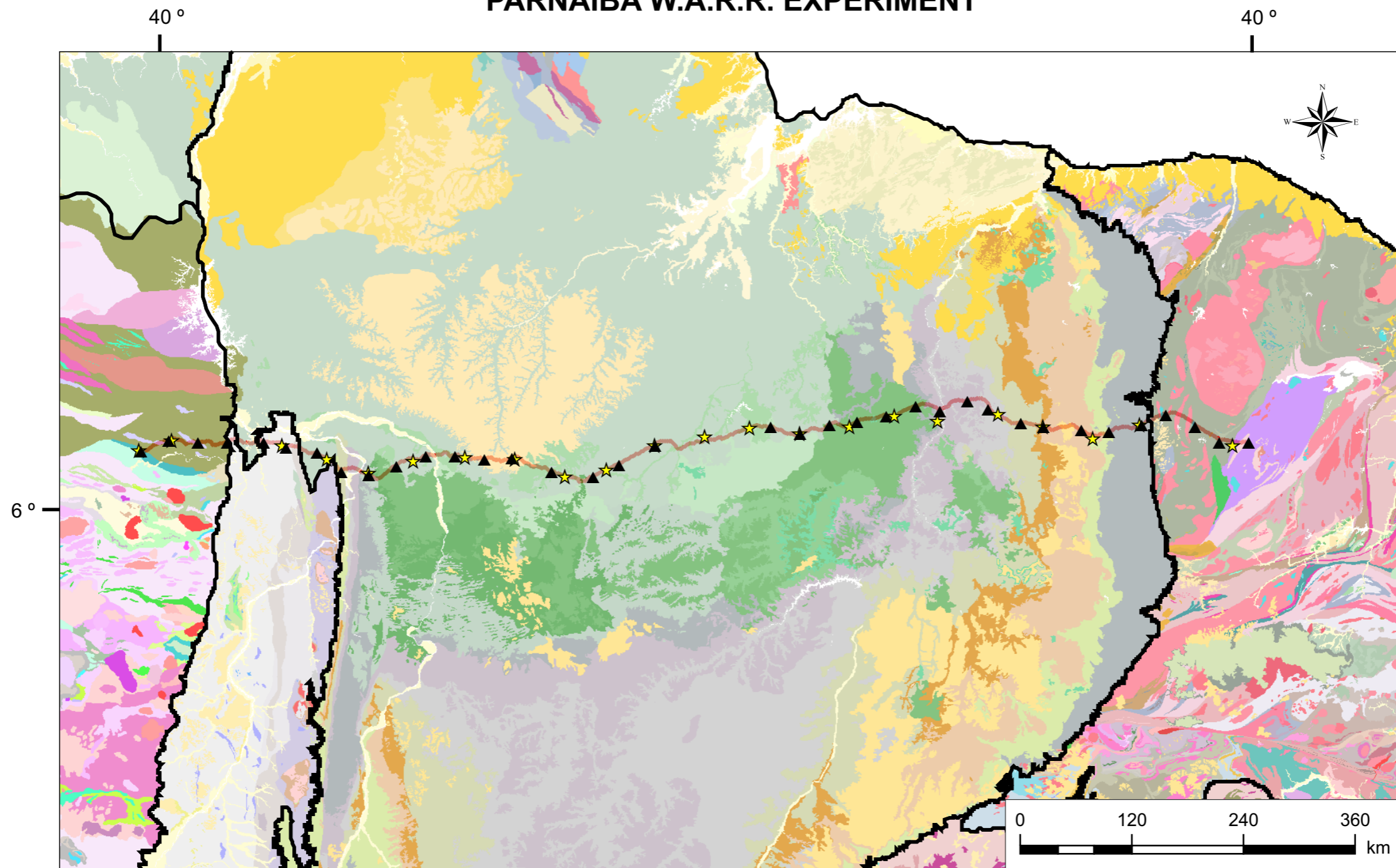
Layout and execution of the experiment

The WARR line is an E-W, 1,200 km long profile crossing the basin and its western and eastern limits, approximately following the path of the PABIP deep seismic reflection profile, which was acquired in 2013 (Daly et al. 2014). Six hundred one-component stations were installed along the profile in September-October 2015 and, during four nights, twenty-two shots, consisting of 1.5 tonnes of explosives each, were detonated. Another thirty-six short-period three-component seismic stations (not archived with this dataset) were deployed along the refraction transect in August 2015, covering (mainly) the extremes of the line and the western and eastern limits of the Parnaíba Basin. The objective was to complement the analysis of the WARR data with receiver function results. These stations worked in continuous mode until January 2016.

Reference

Daly, M.C. et al., 2014. Brasiliano crustal structure and the tectonic setting of the Parnaíba basin of NE Brazil: results of a deep seismic reflection profile. *Tectonics*, 33, 2102–2120, doi:10.1002/2014TC003632

PARNAIBA W.A.R.R. EXPERIMENT



Legend

Amazon Craton

- Gr. Buritirama (Arqueano, mármore, quartzito e xisto)
- Un. Enderbitto Cajazeiras (Arqueano, granulito, anfibolito)
- Un. Piriclasito Rio Preto (Arqueano, granulito máfico)

Tocantins Province

- Fm. Couto Magalhães (Proterozoico, calcário e metassed.)
- Fm. Pequizeiro (Proterozoico, xisto e quartzito)
- Fm. Xambioá (Proterozoico, anfibolito, mármore e quartzito)

Parnaíba Basin

- Fm. Itapecuru (Fanerozoico, xisto e quartzito)
- Fm. Poti (Fanerozoico, arenito, folhelho e siltito)
- Fm. Pedra de Fogo (Fanerozoico, arenito, folhelho e siltito)
- Fm. Sambaiba (Fanerozoico, arenito)
- Fm. Corda (Fanerozoico, arenito, argilito e folhelho)
- Dep. Detríticos e/ou Lateríticos (Cenozoico, laterita)
- Fm. Longá (Fanerozoico, arenito, folhelho e siltito)
- Fm. Cabeças (Fanerozoico, arenito, diamictito e siltito)
- Fm. Pimenteiras (Fanerozoico, arenito, folhelho e siltito)
- Fm. Serra Grande (Fanerozoico, arenito, conglomerado e siltito)

Borborema Province

- Fm. Complexo Ceará (Proterozoico, xisto, anfibolito, quartzito e paragnaisse)
- Suíte Granítica Migmatítica Tamboril Serra Quitéria (Proterozoico, granito, granodiorito, migmatito)
- Un. Máfica a Intermediária (Proterozoico, anfibolito, xisto e, quartzito)
- Complexo Cruzeta - un. Pedra Branca (Arqueano, ortognaisse, metagabro metatonalito e metapiroxenito)
- Complexo Cruzeta - un. Tróia (Arqueano, anfibolito, xisto, gnaisse, metacalcário e metapiroxenito)

- Triaxial Sensors
- Shots
- Vertical Sensors
- Geologic Province Limit

Reference Datum:
South America Datum, 1969