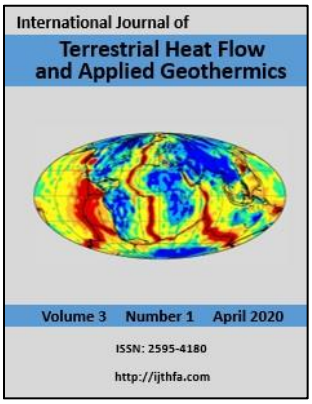
International Journal of Terrestrial Heat Flow and Applied Geothermics
VOL. 3, NO. 1 (2020); P. 45-72.
ISSN: 2595-4180
DOI: https://doi.org/10.31214/ijthfa.v3i1.42

IJTHFA
http://ijthfa.com/



Update of Brazilian Heat Flow Data, within the framework of a multiprong referencing system

Valiya Hamza [1], Fabio Vieira [1], Jorge Gomes [2], Suze Guimaraes [1], Carlos Alexandrino [2], Antônio Gomes [2]

[1] Department of Geophysics, National Observatory, Rio de Janeiro, Brazil.
[2] Institute of Science Engineering and Technology, Federal University of the Jequitinhonha and Mucuri Valleys, Teófilo Otoni, Brazil.

E-mail address
hamza@on.br (V. Hamza)
Corresponding author

Keywords
Heat Flow,
Updated data set,
Brazil,
Multiprong Referencing.

Received: December 27, 2019

Accepted: February 29, 2020

Published: April 01, 2020

Abstract

An updated heat-flow database for Brazil is presented providing details of measurements carried out at 406 sites. It has been organized as per the scheme proposed by the International Heat Flow Commission. The data sets refer to results obtained using methods referred to as interval temperature logs (ITL), underground mines (UMM), bottom-hole temperatures (BHT), stable bottom temperatures (SBT) and water wells (AQT). The compilation provides information on depths of temperature logs, gradient determinations, measurements of thermal conductivity and radiogenic heat production. Also included is information on the methods employed and error estimates of the main parameters. A new heat flow map of Brazil has been derived based on the updated data set. A multipronged system has been employed in citing references, where the indexing scheme adopted follows chronological order. It provides information not only on the primary work concerning heat flow determination but also later improvements in measurements of main parameters (temperature gradients, thermal conductivity and radiogenic heat production) as well as techniques employed in data analysis.

1. Introduction

Studies of terrestrial heat flow were initiated in Brazil during the second half of 1970s. Since 1980s there have been considerable improvements in the acquisition of heat-flow data. Unfortunately, such improvements were not readily incorporated into the compilations available at the web site of IHFC (http://ihfc-iugg.org/products/global-heat-flow-database). Parts of Brazilian heat flow data are included in the compilations of Pollack et al (1993), Hamza et al (2008), Davis and Davis (2010), and Lucazeau (2019).

The earliest attempts at measuring subsurface temperatures were carried out during the early decades of 1960, in Morro Velho gold mine near Belo Horizonte (State of Minas Gerais). Unfortunately, records of such measurements are currently unavailable. Meister (1973) reported uncorrected temperature gradients based on bottom-hole measurements in oil wells drilled in sedimentary basins in the interior regions of Brazil. A preliminary estimate of heat flow was reported by Hamza (1977) for the area of Nuporanga, in the northeastern parts of the State of Sao Paulo. Subsequently, results of temperature logs in boreholes and water wells were compiled by Hamza et al., (1978). This was followed by reports of heat flow measurements in the alkaline intrusive complex of Poços de Caldas, in the southwestern parts of the State of Minas Gerais (Araujo, 1978). Later works include those by Vitorello et al., (1978) for the continental platform areas, by Fontes (1980) in Sergipe and Alagoas basins and by Carvalho (1981) for the Reconcavo basin. New compilations of geothermal gradient data for areas of sedimentary basins reported by Zembruscki (1982) were employed in calculating heat flow values for basins of the Amazon region by Carvalho et al (1986). A similar work was carried out by Pereira and Hamza (1991) for the Parnaiba basin. A summary of earlier heat flow values compiled may be found in the work by Hamza and Munoz (1996). Mention may also be made of recent data acquisitions by Descovi and Vieira (2019). Updated data sets were discussed in the context of 36-degree spherical harmonic expansion of global heat flow (Hamza et al, 2008) and use of GIS techniques (Vieira and Hamza, 2018).

In the present work we report updated compilation of heat flow data for 406 sites in Brazil. A multiprong referencing system has been used in providing information not only on the chronological sequence in acquisition of data on temperature gradient, thermal conductivity and radiogenic heat production but also methods used in analysis and interpretation.

2. Characteristics of the Data Set

Before going into the details of the present compilation, it is convenient to discuss briefly the characteristics of the data sets. We classified thermal data depending on the approach used into five categories: (i) interval temperature logs, (ii) underground mine measurements, (iii) bottom-hole temperatures, (iv) stable bottom temperatures and (v) geothermal studies of flowing wells. In the ITL method, results of temperature measurements at three or more depth levels were employed for calculation of the temperature gradient using the least square method. This approach was also used for data acquisition in underground mine measurements (UMM). The gradient and heat-flow values were corrected for perturbing effects of groundwater flow (see for example, Hamza, 1982; Pimentel and Hamza, 2012), topography (Del Rey and Hamza, 1989), climate change (Nogueira and Hamza, 1994), and drilling disturbances (Hamza et al., 1996) were taken into consideration in reporting the final results.

In many cases, temperature gradient values are derived from results of precision temperature logs in boreholes, bottom-hole measurements in oil wells and complementary measurements in water wells. In the case of oil wells, corrections for drilling disturbances have been made on the basis of AAPG method (AAPG, 1982). Use of more elaborate correction methods were attempted only in selected cases depending on the availability of suitable data on drilling history and mud circulation (Hamza et al, 2005). However, BHT data are widely believed to provide reasonable estimates of gradient values because of the relatively large depths of oil wells and also for the reason that thermal perturbations by in-hole fluid flows are likely to be a minimum at the well bottom.

Hamza et al (1978) pointed out that similar arguments may also be extended for results of measurements in the bottom parts of shallow water wells. Hence results of precision measurements in water wells have been employed for obtaining supplementary estimates of temperature gradients. This procedure is frequently referred to as the SBT method (Ribeiro and Hamza, 1986). As pointed out by Santos et al (1986) results of temperature measurements in wells with water flows may also be used in obtaining reasonably good estimates of thermal gradients. This method allows for corrections for heat losses of fluids during upflows. Data acquired in such procedure is referred to as results of the AQT method. A summary of number of data acquired by these methods is provided in Table 1. The bulk of data compiled are composed of results using the methods of ITL and BHT.

Table 1 – Summary of heat flow data acquired by the different methods in Brazil.

Method		N° of Data
Description	**Abbreviation**	
Interval Temperature logs	ITL	136
Underground Mine measurements	UMM	5
Bottom-hole temperatures	BHT	188
Stable bottom temperatures	SBT	54
Temperatures in Flowing wells	AQT	23
Total		406

3. Organization of the Revised Data Set

The organization adopted for the revised data set follows a format similar to that adopted in earlier IHFC compilations. Thus, the updated set include for each site of data acquisition identification codes, geographic coordinates, elevation, minimum and maximum depths of measurements and methods used in measurements of geothermal gradients and thermal conductivity. Also included for each site are representative values of geothermal gradients, thermal conductivity, heat flow and heat production (see for example Jessop, 1990 and references there in for details).

In all cases, heat-flow values were calculated as the product of representative values of geothermal gradient and thermal conductivity. Heat flow (q) and respective error σq values were calculated using the well-known relations:

$$q = \lambda . G \pm \sigma_q \tag{1a}$$

$$\sigma_q = \sqrt{(\frac{\partial q}{\partial \Gamma})^2 \sigma_\Gamma{}^2 + (\frac{\partial q}{\partial \lambda})^2 \sigma_\lambda{}^2} = \sqrt{\lambda^2 \sigma_\Gamma{}^2 + \Gamma^2 \sigma_\lambda{}^2} \tag{1b}$$

Relevant experimental data were employed for thermal conductivity and radiogenic heat production. A summary of such data has been compiled by Vieira (2015). In the absence of experimental data proxy values were employed. These are indicated in the data tables by using codes L/FTC and L/FHP (abbreviations for values of thermal conductivity and heat production of representative lithotypes or geologic formations). The abbreviations used in these column headings are provided in Table 2

Table 2 - Terms used in data compilation. SC refer to site codes, elevation (EL), temperature measurements, gradients (RG), thermal conductivity (λ), heat production (HP) and heat flow (q).

Term	Description
SC	Descriptive codes for sites.
EL	Elevation (m)
min D	Minimum depth of temperature log (m)
max D	Maximum depth of temperature log (m)
NT	Number of temperature measurements
RG	Temperature gradient (ºC/km)
EEG	Estimated error in geothermal gradient (ºC/km)
MG	Method employed in determination of gradient (see Table 1)
Nλ	Number of thermal conductivity data (λ). L/FTC - Representative value of λ for lithotypes or geologic formation
$R\lambda$	Representative value of thermal conductivity (W/m/K)
EEλ	Error thermal conductivity (λ)
$M\lambda$	Method employed in measurement of λ: DB - Divided bar; HW – Hot-wire; LS – Line source; PS – Plane source
NHP	Number of heat production (HP) measurements ($\mu W/m^3$). L/FHP - Value of HP for representative lithotypes or geologic formations.
RQ	Representative heat flow (mW/m^2)
EEQ	Estimated error in heat flow (mW/m^2)

The geographic distribution of sites where heat flow data has been acquired is shown in the map of Figure 1. Also included is the code for indicating the method employed in determination of heat flow values. The geographic distribution of sites where heat flow data has been acquired is shown in the map of Figure 1. Note that most of the measurement sites are located in the eastern parts of Brazil. Data density is poor in the northern and eastern parts of Brazil.

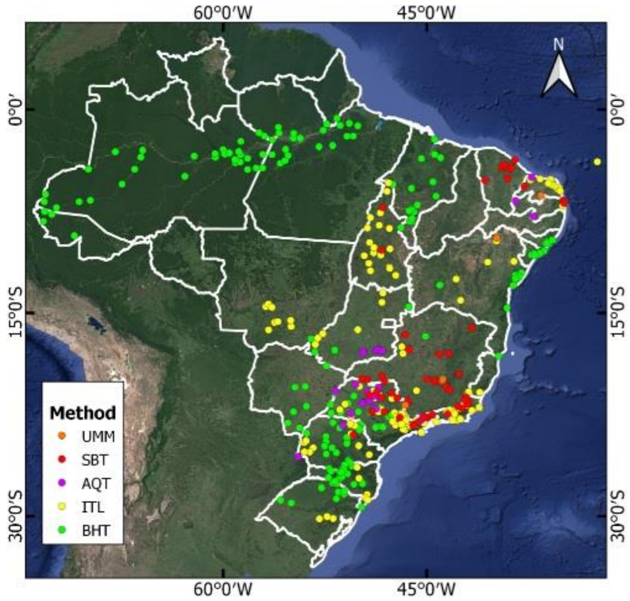


Figure 1 - Locations of heat-flow measurements. The color scheme indicates the method used for heat flow determination. For details, see the text.

4. Heat Flow Map of Brazil

The detailed list of data obtained for 406 sites is grouped as per the year of acquisition of geothermal gradient data. The revised data set has been employed in deriving an updated heat flow map of Brazil, presented in Figure (2).

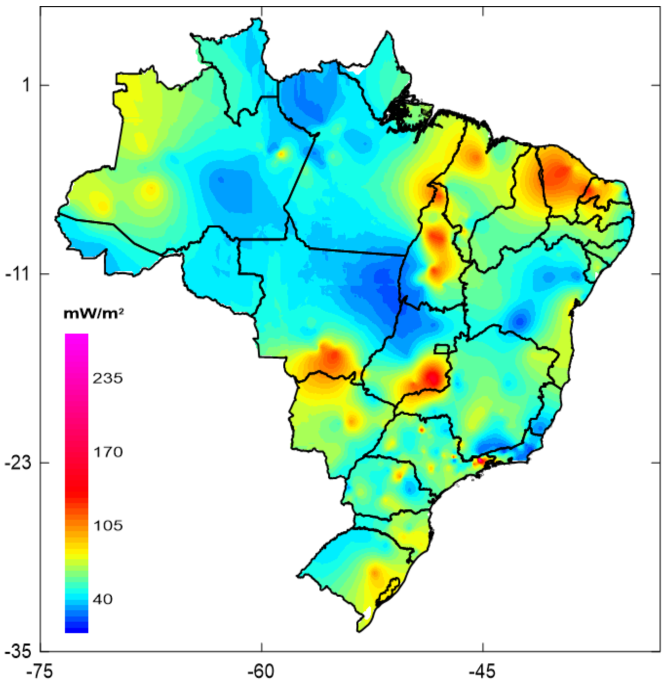


Figure 2 - Heat flow map of Brazil based on the revised data set.

Heat flow values higher than 80mW/m^2 are found in the northeastern state of Brazil, along a north-south trending belt extending over the western edge of the State of Maranhão through the northern parts of the central state of Tocantins. There are also indications of high heat flow in the eastern parts of the southern states of Santa Catarina and Rio Grande do Sul. Normal to low heat flow, with values less than 60 mW/m^2, is predominant in large parts of the central parts of Brazilian territory. It includes mostly regions adjacent to Guiana craton in the northern state of Para, areas in the southwestern parts of the state of Amazonas and eastern parts of the State of Mato Grosso. These latter areas are parts of the Amazon craton.

5. Multiprong Reference System

A multiprong reference system has been employed in the present work that provides a convenient framework for citation of publications. It makes use of system of cells with interconnecting rows and columns for classifying the information. Consider for example the top row of the table illustrated in Appendix 1. The first cell at the top left specifies the site codes (1 to 7). The second cell is divided into three sub cells that specify the data types. The parameter in the top sub cell, designated "g1", indicates the first measurement of temperature gradient for this site. the details of which are in the sub cells to the right. The sub cell below "g1" specifies parameters designated as "g2", "c" and "q". The designation "g2" refers to the reference providing revised value of gradient for this site while "c" and "q" refer respectively to references for determinations of thermal conductivity and heat flow. The last sub cell below these specifies the parameter "r" which indicates the reference for radiogenic heat production.

This scheme is repeated for the remaining cite codes. Note that the first row in this table provides the primary reference for temperature gradient, while the subsequent rows for the same site code provide references for thermal conductivity, heat flow and radiogenic heat production. Also, the letter codes given in second column provide connecting links between references and results of measurements. These are indicated by letter codes g (for temperature gradient), c (for thermal conductivity), q (for heat flow) and r (for radiogenic heat production). The numbers appended to the letter codes indicate the numerical sequences of the references. For example, the code "g1" indicate the first reference for values of geothermal gradients at the site identified in the first column, while subsequent number-appended codes "g2", "g3", etc. indicate later references for reporting additional data sets for temperature gradients. Similar schemes were also adopted for indicating references for thermal conductivity (c), heat flow (q) and radiogenic heat production (r).

The table in Appendix 2 provides values of temperature gradient, thermal conductivity, heat production and heat flow. In many cases the values published in the primary reference have been revised allowing corrections and alterations. Details of such corrections may be found in the supplementary list of references.

6. Conclusions

The present work provides details of heat flow measurements carried out at 406 sites, organized as per the framework proposed by the International Heat Flow Commission - IHFC. It includes data on geographic coordinates and altitudes, values of minimum and maximum depths of temperature logs in boreholes, number of measurements of temperature, thermal conductivity and heat production as well as representative values of geothermal gradient, thermal conductivity, heat flow and radiogenic heat production for all sites. During the present work it became apparent that much of supplementary data were reported in later publications. An example is the results of radiogenic heat production measurements. The initial heat production values reported by Vitorello et al (1980) which were complemented with later improvements by Iyer et al (1984). Also relevant are results of airborne radiometric surveys reported by Guimaraes et. al (2013). The multiprong referencing system readily allows inclusions of these improvements.

Also reported in later publications are results of perturbing effects of recent climate changes, topography, local thermal refraction effects, formation and in-hole water flows and drilling disturbances. In addition, there are reports of advances in technology for measurement of temperature gradients and thermal conductivity.

Clearly, there is need for a multiprong referencing system that provide information not only of primary works but also later developments dealing with evolution of new data sets. The present work constitutes the application of such a referencing system for heat flow data acquired in Brazil for the period of 1973 to 2019. The main advantage of the new referencing system is that it provides the sequential history of works related to acquisition and analysis of terrestrial heat flow data.

7. Acknowledgements

The first author is recipient of a research scholarship (Process No. 306755/2017-3) granted by the National Research Council of Brazil (CNPq).

References

Araujo, R.L.C., 1978. Study of heat flow in the alkaline complex of Poços de Caldas (in Portuguese), Unpublished M.Sc. Thesis, Univ. of Sao Paulo.

Birch, F., 1954. The present state of geothermal investigations, Geophysics, vol.19, pp. 645–659.

Bullard, E. C., 1939. Heat flow in South Africa, Proc. Roy. Soc. London., 173, 474–502.

Carvalho, H.S., Vacquier, V., 1977. Method for determining terrestrial heat flow in oil fields. Geophysics, 42, 3, 584-593.

Davies, J. H., Davies, D. R., 2010. Earth's surface heat flux. Solid Earth, 1(1), 5-24.

Descovi, P., Vieira, F.P., 2019. Regions of anomalous geothermal fields in the State of Tocantins, Central Brazil. International Journal of Terrestrial Heat Flow and Applied Geothermics, 2, 1, 30-36.

Guimaraes, S. N. P., Hamza, V. M., da Silva, J. J. 2013. Airborne geophysical surveys in the north-central region of Goias (Brazil): implications for radiometric characterization of tropical soils. Journal of environmental radioactivity, 116, 10-18

Hamza V.M., Cardoso R.R., Ponte Neto C.F. 2008. Spherical Harmonic Analysis of Earth's Conductive Heat Flow. International Journal of Earth Sciences, 97, 205-226.

Hamza, V. M., Eston, S. M., Araujo, R., Vitorello, I., Ussami, N., 1978, Brazilian Geothermal Data Collection – Series 1, Publication 1109, Institute for Technology Research - IPT, São Paulo.

Iyer, S. S., Babinski, M., Hamza, V. M. 1996. Radiogenic heat production in sedimentary rocks of the Bambui Group: implications for thermal history and hydrocarbon generation. Anais.

Iyer, S.S., Choudhuri, A., Vasconsellos, M.B.A. and Cordani, U.G., 1984, Radioactive element distribution in the Archean granulite terrain of Jequié, Bahia, Brazil. Contrib. Mineral. Petrol., 85, 95 – 101.

Jessop, A.M., Hobart, M.A., Sclater, J.G., 1976. Geothermal Service of Canada, The world heat flow data collection – 1975. Geothermal Series Number 5, Ottawa, Canada.

Lucazeau, F., 2019. Analysis and Mapping of an Updated Terrestrial Heat Flow Data Set. Geochemistry, Geophysics, Geosystems, 20(8), 4001-4024.

Meister, E.M., 1973, Geothermal gradients in sedimentary basins of Brazil (in Portuguese). Boletim Técnico da PETROBRAS, 16(4).

Pimentel, E.T., Hamza, V.M., 2012. Indications of regional scale groundwater flows in the Amazon Basins: Inferences from results of geothermal studies. Journal of South American Earth Sciences, 37, 214-227.

Pollack, H.N., Hurter, S.J. and Johnson, J.R., 1993. Heat flow from the Earth's interior: Analysis of the global data set, Reviews of Geophysics, 31, 3, 267 – 280.

Ribeiro, F.B. and Hamza, V.M., 1986. Stabilization of Bottom-hole Temperatures in the presence of Formation Fluid, Flows, Geophysics, V. 51, p. 410-413.

Santos, J., Hamza, V.M., Shen, P.Y. 1986. A method for measurement of terrestrial heat flow density in water wells. Brazilian Geophysical Journal, 4, 45-53.

Vieira F.P., 2015. Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, National Observatory, Rio de Janeiro, pp 172.

Vieira, F.P., Hamza, V.M., 2018. Global Heat Flow: New Estimates Using Digital Maps and GIS Techniques, International Journal of Terrestrial Heat Flow and Applied Geothermics, 1, 1, 6-13.

Vitorello, I., Hamza, V.M., Pollack, H.N. 1980. Terrestrial heat flow in the Brazilian highlands. J. Geophys. Res. 85, 3778-3788.

Appendix 1

Table A1 - Site Codes, Data Types, and year of publication for data sets compiled in the present work.
Codes for data types are g– temperature gradient; c- thermal conductivity; q- heat flow; r-radiogenic heat production.
The numbers appended to data types indicate numerical order for multiple references. See text for details.

Site Code	Data Types	Reference	
		Authors and Year of Publication	Title, volume and page numbers
BRZ001 to BRZ007	g1	Meister, E.M., 1973	Geothermal gradients in sedimentary basins of Brazil (in Portuguese). Boletim Técnico da PETROBRAS, 16(4).
	g2	Pimentel, E.T., 2013	Thermal structure of the crust in the Amazon region with focus on flow of groundwater in areas of sedimentary basins (in Portuguese). Unpublished Ph. D. Thesis, National Observatory, Rio de Janeiro, Brazil.
	c		
	q		
	r	Vieira, F.P., 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, Brazil, pp 172.
BRZ008	g1	Hamza, V.M., 1977	Geothermal measurements in an area of induced seismic activity (in Portuguese), Internal report, Inst. Astronomy and Geophysics, University of São Paulo, Brazil
	g2	Higashi, T. and Hamza, V.M., 1996	Geothermal Investigations in an area of induced seismic activity in northern Sao Paulo State, Brazil. Tectonophysics, 253, 209-225.
	c	Hamza, V.M., 1977	Geothermal measurements in an area of induced seismic activity (in Portuguese), Internal report, Inst. Astronomy and Geophysics, University of São Paulo, Brazil
	q		
	r	Vieira, F.P., 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, Brazil, pp 172.
BRZ009 to BRZ016	g	Hamza, V.M., Eston, S.M., Araujo, R., Vitorello, I., Ussami, N., 1978	Brazilian Geothermal Data Collection – Series 1, Publication 1109, Institute for Technology Research - IPT, São Paulo.
	c	Hamza, V.M., Munoz, M., 1996	Heat flow map of South America, Geothermics, 25(6): 599–646.
	q		
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, Brazil, pp 172.

BRZ017 to BRZ019	g1	Araujo, 1978	Study of heat flow in the alkaline complex of Poços de Caldas (in Portuguese), Unpublished M.Sc. Thesis, Univ. of Sao Paulo.
	g2	Hamza, V. M., 1982	Terrestrial Heat Flow in the Alkaline intrusive complex of Poços de Caldas, Brazil, *Tectonophysics*, *V. 83*, pp. 45-62.
	c1	Araujo, 1978	Study of heat flow in the alkaline complex of Poços de Caldas (in Portuguese), Unpublished M.Sc. Thesis, Univ. of Sao Paulo.
	c2	Hamza, V. M., 1982	Terrestrial Heat Flow in the Alkaline intrusive complex of Poços de Caldas, Brazil, *Tectonophysics*, *V. 83*, pp. 45-62.
	q1	Araujo, 1978	Study of heat flow in the alkaline complex of Poços de Caldas (in Portuguese), Unpublished M.Sc. Thesis, Univ. of Sao Paulo.
	q2	Hamza, V. M., 1982	Terrestrial Heat Flow in the Alkaline intrusive complex of Poços de Caldas, Brazil, *Tectonophysics*, *V. 83*, pp. 45-62.
BRZ020 to BRZ029	g1	Costa, T.B., 1980	Measurements of geothermal gradients and heat flow in the State of Rio Grande do Norte (in Portuguese, Personal communication)
	c1		
	q1		
	g2	Hamza, V.M., Santos, J., Costa, T.B., 1980	Geothermal methods applied to exploration of groundwater in the Northeastern region, (Internal Report for Project SUDENE, 1978 - 1980).
	c2		
	q2		
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ030 to BRZ036	g	Shiraiwa, S., 1980	Measurements of geothermal gradients and heat flow in the State of Mato Grosso (in Portuguese, Personal communication)
	c		
	q		
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ037 to BRZ056	g	Fontes, L.C.A., 1980	Determination of terrestrial heat flow in the sedimentary basins of Sergipe and Alagoas (in Portuguese), Unpublished M.Sc. Thesis, Federal University of Bahia (Brazil), pp.83.
	c		
	q		
	r	Sapucaia1, N.S., Argollo, R.M., Barbosa, J.S.F., 2005	Abundances of Potassium, Uranium and Thorium and Radiogenic Heat Production in basement rocks adjacent to the sedimentary basins of Camamu and Almada, Bahia, Brazil (in Portuguese), Brazilian Geophysical Journal, 23(4): 453-475

BRZ057 to BRZ076	g1	Vitorello, I., Hamza, V.M., Pollack, H.N., Araujo, R.L.C., 1978	Geothermal Investigations in Brazil, Rev. Brasileira de Geociências,vol. 8, pp. 71-89.
	g2	Hamza, V.M., Eston, S.M., Araujo, R., Vitorello, I., Ussami, N., 1978	Brazilian Geothermal Data Collection – Series 1, Publication 1109, Institute for Technology Research - IPT, São Paulo.
	g3	Vitorello, I. 1978	Heat flow and radiogenic heat production in Brazil, with implications for thermal evolution of continents. Ph. D. dissertation,Univ. of Michigan, Ann Arbor, U.S.A.
	g4	Vitorello, I., Hamza, V.M., Pollack, H.N., 1980	Terrestrial heat flow in the Brazilian highlands. *J. Geophysical. Res*. **85**, 3778-3788
	c		
	q		
	r1		
	r2	Hamza, V.M., 1981	Estimates of terrestrial heat flow and radiogenic heat production in Eastern Brazil. Proc. 31st Geol. Congress, Balneário Camboriú, SC, 2, 1149-1160.
	r3	Iyer, S. S., Kakazu, M. H., Choudhuri, A., 1987	Radiogenic heat production from the São Francisco Craton: Possible link to Archean crustal stability. Brazilian Geophysical Journal, 5, 205-212.
	r4	Iyer, S.S., Hamza, V.M., 1992	Paleo heat flow and paleo heat generation in granulite facies terrains: implications for thermal regimes during metamorphism. Proc. Can. Geoph. Un., Banff, p. 41.
	r5	Sighinolfi, G.P., Sakai, T., 1977	Uranium and Thorium in Archean granulite facies terrain of Bahia (Brazil). Geochemical. J., 11, 33 – 39.
BRZ077 to BRZ083	g	Hamza, V.M., Santos, J., Costa, T.B., 1980	Use of geothermal methods in exploration of groundwater in the Northeastern region (in Portuguese), Internal Report for Project - SUDENE, 1978 - 1980).
	c1		
	q		
	c2	Figueiredo, E.R.H. 2006	Thermal conductivity of rocks: An application for ornamental granites (in Portuguese), Unpublished M.Sc. Thesis, University of Rio Grande do Norte, Natal.
	r	Sapucaia1, N.S., Argollo, R.M., Barbosa, J.S.F., 2005	Abundances of Potassium, Uranium and Thorium and Radiogenic Heat Production in basement rocks adjacent to the sedimentary basins of Camamu and Almada, Bahia, Brazil (in Portuguese), Brazilian Geophysical Journal, 23(4): 453-475
BRZ084 to BRZ089	g1	Carvalho, H.S., 1981	Method for determination of geothermal flux in petroliferous sedimentary basins of Recôncavo (Brazil) and Sumatra (Indonesia), Unpublished Ph.D. Thesis, Federal University of Bahia (Brazil), pp. 92.
	c1		
	q1		
	g2	Carvalho, H.S., Vacquier, V., 1977	Method for determining terrestrial heat flow in oil fields. Geophysics, 42, 584-593.
	c2		
	q2		
	c3	Pereira, S.E., 2008	Thermal properties of basement rocks adjacent to the Recôncavo basin (in Portuguese), Undergraduate thesis work, Federal University of Bahia (Brazil)
	r1	Alves Junior, 2004	Determination of profiles of radiogenic heat production in wells of Recôncavo basin (in Portuguese), Monograph, Federal University of Bahia (Brazil).
	r2	Sapucaia, N.S., Argollo, R.M., Barbosa, J.S.F., 2005	Abundances of Potassium, Uranium and Thorium and Radiogenic Heat Production in basement rocks adjacent to the sedimentary basins of Camamu and Almada, Bahia, Brazil (in Portuguese), Brazilian Geophysical Journal, 23(4): 453-475

BRZ90 to BRZ97	g1	Eston, S.M., Hamza, V.M., Becker, E.A., Furumoto, S., 1982	Geothermal research for hydrocarbon exploration in the Parana basin. Internal Report, No. 18106, Institute for Technology Research, São Paulo, Brazil.
	g2	Eston, S.M., Hamza, V.M., Becker, E.A., Furumoto, S., 1983	Geothermal research for hydrocarbon exploration in the Parana basin. Internal Report, No. 18271, Institute for Technology Research, São Paulo, Brazil.
	c1	Eston, S.M., Hamza, V.M., Becker, E.A., Furumoto, S., 1982	Geothermal research for hydrocarbon exploration in the Parana basin. Internal Report, No. 18106, Institute for Technology Research, São Paulo, Brazil.
	c2	Eston, S.M., Hamza, V.M., Becker, E.A., Furumoto, S., 1983	Geothermal research for hydrocarbon exploration in the Parana basin. Internal Report, No. 18271, Institute for Technology Research, São Paulo, Brazil.
	q1	Eston, S.M., Hamza, V.M., Becker, E.A., Furumoto, S., 1982	Geothermal research for hydrocarbon exploration in the Parana basin. Internal Report, No. 18106, Institute for Technology Research, São Paulo, Brazil.
	q2	Eston, S.M., Hamza, V.M., Becker, E.A., Furumoto, S., 1983	Geothermal research for hydrocarbon exploration in the Parana basin. Internal Report, No. 18271, Institute for Technology Research, São Paulo, Brazil.
	r1	Hamza, V. M., 1980	Estimates of Terrestrial Heat Flow and radiogenic heat production in Eastern Brazil, Proceedings of the *XXXI* Brazilian Geological Congress, *vol. 2*, pp. 1149-1160.
	r2	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ098 to BRZ103	g1	Zembruscki, S.G., 1982	Geothermal gradients in sedimentary basins of Brazil (in Portuguese), CENPES, PETROBRAS, Internal Report 483, 57p.
	g2	Pimentel, E.T., 2013	Thermal structure of the crust in the Amazon region with focus on flow of groundwater in areas of sedimentary basins (in Portuguese). Unpublished Ph. D. Thesis, National Observatory, Rio de Janeiro, Brazil.
	c		
	q		
	r1	Pimentel, E.T., 2013	Thermal structure of the crust in the Amazon region with focus on flow of groundwater in areas of sedimentary basins (in Portuguese). Unpublished Ph. D. Thesis, National Observatory, Rio de Janeiro, Brazil.
	r2	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ104 to BRZ106	g	Hamza, V.M., Eston, S.M., 1983	Assessment of Geothermal resources of Brazil - 1981*, Zentralbau für Geol. Paläontologe. I,* p.128-155
	c		
	q		
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.

BRZ107 To BRZ110	g c q	Eston, S.M. and Hamza, V.M., 1984	Energia Geotérmica no Brasil: Avaliação de Recursos, Avanços Tecnológicos e Perspectivas de Utilização. In: Simpósio Brasileiro Sobre Técnicas Exploratórias Aplicadas á Geologia, Salvador, v.1, p. 109-132.
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ111 to BRZ122	g1	Hamza, V.M., Frangipani, A., Becker, E.A., 1986	Maps of geothermal gradients and energy resources of the State of São Paulo - Phase 1 – Administrative regions of São Jose dos Campos, Taubaté, Guaratinguetá and Cruzeiro. Internal Report No. 23562, Institute for Technology research - IPT, São Paulo, Brazil.
	g2	Rodrigues, I.F., 2007	Thermal structure of taphrogenic basins and the underlying crust of post-Mesozoic age in the southeastern region of Brazil (in Portuguese), Unpublished M.Sc. Thesis, National Observatory, Rio de Janeiro, Brazil, pp 220.
	g3	Souza Filho, M.N., 2012	Assessment of Geothermal Potential of Taubate basin – SP (in Portuguese), Unpublished M.Sc. Thesis (173/2012), State University of Campinas, Brazil, 103pp.
	c1 q1	Rodrigues, I.F., 2007	Thermal structure of taphrogenic basins and the underlying crust of post-Mesozoic age in the southeastern region of Brazil (in Portuguese), Unpublished M.Sc. Thesis, National Observatory, Rio de Janeiro, Brazil, pp 220.
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ123 to BRZ131	g1 c1 q1	Santos, J., 1986	Geothermal flux density in the Parana basin, Unpublished M.Sc. Thesis, University of São Paulo, Brazil
	g2 q2	Santos, J., Hamza, V.M., Shen, P.Y., 1986	A method for determining terrestrial heat flow density in water wells, Brazilian Geophysical Journal, 4, 45 - 53.
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ132	g1	Yamabe, T.H., 1986	Geothermal studies in an area of induced seismicity, Unpublished report, USP
	c1 q1 r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ132 to BRZ137	g c q	Hamza, 1987	Geothermics in prospection and exploration of hydrocarbons (in Portuguese). Internal Report, pp. 161, Geothermal Laboratory, IPT, São Paulo (Brazil).
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.

BRZ138 to BRZ189	g1	Carvalho, H.S., Simões Lobo, P.F., Prazeres Campos, J.N., Zembruscki, S.G., 1987	Study of heat flow fluid movements in the Middle Amazon basin. Brazilian Geophysical Journal. 5:231-243.
	g2	Pimentel, E.T., 2013	Thermal structure of the crust in the Amazon region with focus on flow of groundwater in areas of sedimentary basins (in Portuguese). Unpublished Ph. D. Thesis, National Observatory, Rio de Janeiro, Brazil.
	c1	Carvalho, H.S., Simões Lobo, P.F., Prazeres Campos, J.N., Zembruscki, S.G., 1987	Study of heat flow fluid movements in the Middle Amazon basin. Brazilian Geophysical Journal. 5:231-243.
	c2	Pimentel, E.T., 2013	Thermal structure of the crust in the Amazon region with focus on flow of groundwater in areas of sedimentary basins. Ph. D. Thesis, Nat. Observatory, Brazil
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Ph. D. Thesis, Nat. Obs., Brazil, pp 172.
BRZ190 to BRZ197	g1	Becker, E.A., Hamza, V.M., 1987	Zones of high geothermal gradients in the State of Ceara (in Portuguese), II Regional Geophysics Meeting, Salvador, Brazil.
	c1 q1	Hamza, V.M., Frangipani, A., Becker, E.A., 1987	Geothermal Maps of Brazil. Internal Report No. 25305, Institute for Technology research - IPT, São Paulo, Brazil.
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ198 to BRZ205	g1	Del Rey, A.C., 1989	Hydro-geothermal studies of the Regions of Águas de Lindóia, Amparo and Socorro, Northeastern parts of the State of São Paulo (in Portuguese), Unpublished M.Sc. Thesis, Univ. of Sao Paulo, pp 135.
	g2	Del Rey, A.C., Hamza, V.M., 1989	Terrestrial Heat Flow variations in the northeastern parts of the state of São Paulo: A case for transport of geothermal heat by inter-fracture fluid flows, In Hydrogeological Regimes and their subsurface thermal effects. Geo. Mono. 47, Am. Un., p. 137 - 148.
	c1	Del Rey, A.C., 1989	Hydro-geothermal studies of the Regions of Águas de Lindóia, Amparo and Socorro, Northeastern parts of the State of São Paulo (in Portuguese), Unpublished M.Sc. Thesis, Univ. of Sao Paulo, pp 135.
	c2	Del Rey, A.C., Hamza, V.M., 1989	Terrestrial Heat Flow variations in the northeastern parts of the state of São Paulo: A case for transport of geothermal heat by inter-fracture fluid flows, In Hydrogeological Regimes and their subsurface thermal effects. Geo. Mono., 47, A. G. Un., p.137-148
	q1	Del Rey, A.C., 1989	Hydro-geothermal studies of the Regions of Águas de Lindóia, Amparo and Socorro, Northeastern parts of the State of São Paulo (in Portuguese), Unpublished M.Sc. Thesis, Univ. of Sao Paulo, pp 135.
	q2	Del Rey, A.C., Hamza, V.M., 1989	Terrestrial Heat Flow variations in the northeastern parts of the state of São Paulo: A case for transport of geothermal heat by inter-fracture fluid flows, In Hydrogeological Regimes and their subsurface thermal effects. Mono. 47, Am. Geo. Un., p. 137 - 148.
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.

BRZ206	g, c q	Hamza, 1990	Geothermal gradients and heat flow in Fernando de Noronha, Unpublished Report, National Observatory, Rio de Janeiro, Brazil
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ207 to BRZ222	g, c q	Pereira, A.J.O., Hamza, V.M. 1991	Geothermal heat flux in the Parnaiba basin (in Portuguese), Proc. Int. Congress of the Brazilian Geophysical Society, 2, pp. 177-182.
	r1	Iyer, S.S., Choudhuri, A., Vasconcellos, M.B.A., Cordani, U.G., 1984	Radioactive element distribution in the Archean granulite terrain of Jequié, Bahia, Brazil. Contributions to Mineralogy and Petrology. V. 85, 95-101.
	r2	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ223 to BRZ287	g1	Meister, E.M., 1973	Geothermal gradients in sedimentary basins of Brazil (in Portuguese). Boletim Técnico da PETROBRAS, 16(4).
	g2	Zembruscki, S.G., 1982	Geothermal gradients in sedimentary basins of Brazil (in Portuguese), CENPES, PETROBRAS, Internal Report 483, 57p.
	g3 c q	Hurter, S.J., 1992	Heat flow, thermal structure and thermal evolution of the Paraná basin, Southern Brazil, Unpublished Ph. D. thesis, Univ. of Michigan, Ann Arbor, 148pp.
BRZ288 To BRZ289	g c q	Yamabe, T.H., 1999	Geophysical studies for explaining induced seismicity and orientation for exploration of groundwater in Nuporanga – SP (in Portuguese). Unpublished Ph.D. Thesis, Inst. Astronomy and Geophysics, Univ. of Sao Paulo, Brazil.
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ290	g, c q	Gomes, A.J., Hamza, V.M. 2003	Geothermal gradient and heat flow in Sabará gold mine, Unpublished report to Anglo Gold Ashanti Inc., Sabará (MG), Brazil
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ291 to BRZ296	g, c q	Ferreira, L.E.T., 2003	Assessment of geothermal resources of the State of Goiás (in Portuguese), Unpublished M.Sc. Thesis, National Observatory, Rio de Janeiro, Brazil, 139pp.
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.

BRZ297 to BRZ321	g	Gomes, A.J.L., Hamza, V.M., 2005	Geothermal gradient and heat flow in the State of Rio de Janeiro, Brazilian Geophysical Journal, 23(4), 325-347.
	c		
	q		
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ322	g	Hamza, 2005	Heat flow in Butantã, Sao Paulo, Internal Report, National Observatory (Rio de Janeiro)
	c		
	q		
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ323 to BRZ325	g1	Hamza, V.M., Gomes, A.J.L. and Vieira, F.P., 2005	Geothermal studies in Bebedouro - SP, Unpublished report, National Observatory, Rio de Janeiro, pp 12
	g2	Yamabe, T.H., Assumpção, M., Afonso E.V. Lopes, A.E.V., Barbosa, J.R., Bianchi, M., Galhardo, L., Schramm, D., 2015	Seismic activity in Bebedouro, Northern region of the State of Sao Paulo – Another case of seismicity induced by tube wells (in Portuguese). Proceedings XIV Encontro Nacional de Perfuradores de Poços and II Simpósio de Hidrogeologia do Sudeste
	c	Hamza, V.M., Gomes, A.J.L. and Vieira, F.P., 2005	Geothermal studies in Bebedouro - SP, Unpublished report, National Observatory, Rio de Janeiro, pp 12
	q		
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Ph. D. Thesis, Nat. Obs., Brazil, pp 172.
BRZ326 to BRZ329	g	Silva, G.B.D., 2006	Depths of Curie temperature in South Bahia region – Spectral analysis of high-resolution aeromagnetic data (in Portuguese), Unpublished M.Sc. Thesis, National Observatory, Rio de Janeiro, Brazil, 139pp.
	c		
	q		
	r1	Sapucaia, N.S., Argollo, R.M., Barbosa, J.S.F., 2005	Abundances of Potassium, Uranium and Thorium and Radiogenic Heat Production in basement rocks adjacent to the sedimentary basins of Camamu and Almada, Bahia, Brazil (in Portuguese), Brazilian Geophysical Journal, 23(4): 453-475
	r2	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ330 to BRZ346	g	Alexandrino, C.H., 2008	Thermal field of the São Francisco Structural Province and adjacent mobile belts Unpublished Ph. D. Thesis, National Observatory, Rio de Janeiro.
	c		
	q		
	r1		
	r2	Iyer, S.S., Choudhuri, A., Vasconcellos, M.B.A., Cordani, U.G., 1984	Radioactive element distribution in the Archean granulite terrain of Jequié, Bahia, Brazil. Contributions to Mineralogy and Petrology. V. 85, 95-101.

BRZ347 to BRZ365	g	Gomes, A.J., Hamza, V.M. 2008	Gradient and Heat Flow in the State of Santa Catarina (in Portuguese). Proc. 9th International Congress of the Brazilian Geophysical Society, Salvador, Bahia, Brazil, 11-14 September, p. 978-983.
	c		
	q		
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ366 to BRZ383	g	Gomes, A.J.L., 2009	Assessment of Geothermal Resources of the Parana basin (in Portuguese), Unpublished Ph. D. Thesis, National Observatory, Rio de Janeiro, pp 141.
	c		
	q		
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ384 to BRZ385	g	Shiraiwa, S., 2012	Heat flow in the State of Mato Grosso (in Portuguese), Unpublished Report, Federal University of Mato Grosso, Cuiaba, Mato Grosso (Brazil)
	c		
	q		
	r	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.
BRZ386 to BRZ406	g	Descovi, P., 2018	Geotectonic Province of Tocantins: Assessment of Geothermal Resources, Unpublished M.Sc. Thesis, National Observatory, Rio de Janeiro, pp 89.
	c		
	q		
	r1	Iyer, S. S., Barbosa, J.S.F., Hamza, V.M., Marinho, V.M., 1996	Temporal variation of radioactivity and radiogenic heat production in Archean granulite facies terrains in São Francisco Craton, Brazil: A lead isotope approach. XXXIX Brazilian Geological Congress, Salvador, Brazil, Sept. 1 to 6, 1996
	r2	Vieira, 2015	Medium and high enthalpy geothermal resources in Brazil: Assessment and perspectives for utilization (in Portuguese), Unpublished Ph. D. Thesis, Chapter 3, National Observatory, Rio de Janeiro, pp 172.

Appendix 2

Table A2 - Updated data base providing site codes (SC), coordinates, values of elevation (EL), minimum and maximum depths (min D and max D) of temperature measurements, gradients (RG), thermal conductivity (λ), heat production (HP) and heat flow (q) for geothermal data set of Brazil. Also included are respective numbers of measurements (NT. N λ and Nq) as well as error estimates (SDG, SD λ and SDQ). The abbreviations MG and M λ refer to respective methods of determinations of geothermal gradient and thermal conductivity. The last two columns provide the number of measurement sites (NS) and the year of publication (YP). See text for details.

SC	Site Name	Coordinates		EL	min D	max D	Gradient (ºC/km)				λ (W/m/K)				HP (μW/m³)		q (mW/m²)		NS	YP
		Lon.	Lat.	(m)	(m)	(m)	NT	RG	SDG	MG	N λ	R λ	SDλ	M λ	NHP	RHP	RQ	SDQ		
BRZ001	Cruzeiro Sul	-72.6461	-7.7292	182	0	2623	2	19.0	1.9	BHT	3	2.3	0.5	DB	L/FHP	1.0	44	12	1	1973
BRZ002	Juruá Mirim	-73.2694	-8.2467	195	0	2864	2	16.0	1.6	BHT	3	2.6	0.5	DB	L/FHP	1.0	42	14	1	1973
BRZ003	Rio Azul	-73.1678	-7.5269	230	0	2917	2	17.0	1.7	BHT	3	2.6	0.5	DB	L/FHP	1.0	44	13	1	1973
BRZ004	Rio Embira	-70.9819	-9.2975	270	0	772	2	13.7	1.4	BHT	3	2.6	0.5	DB	L/FHP	1.0	36	12	1	1973
BRZ005	Rio Apore	-50.0833	-1.2000	2	0	1467	2	23.0	2.3	BHT	L/FTC	2.6	0.5	DB	L/FHP	1.0	60	15	1	1973
BRZ006	Limao	-51.6242	-0.6511	77	0	1800	2	17.9	1.8	BHT	3	2.6	0.5	DB	L/FHP	1.0	47	12	1	1973
BRZ007	Alvorada Norte	-46.3284	-14.5527	708	0	1202	2	18.5	1.8	BHT	L/FTC	2.5	0.5	DB	L/FHP	1.0	46	12	1	1973
BRZ008	Nuporanga CC	-45.7542	-20.7303	775	100	140	9	36.07	1.2	ITL	15	2.1	0.4	DB	L/FHP	**1.0**	76	16	1	1977
BRZ009	Lucelia	-51.0189	-21.7203	460	0	160	5	37.90	1.2	ITL	L/FTC	2.1	0.4	DB	L/FHP	1.0	80	20	1	1978
BRZ010	Piqueri	-52.9167	-30.1833	108	100	760	67	22.88	1.4	ITL	5	3.2	0.6	DB	L/FHP	3.0	73	15	1	1978
BRZ011	Serra Azul	-47.5667	-21.3167	610	60	180	13	16.77	1.5	ITL	L/FTC	3.0	0.6	DB	L/FHP	1.0	50	12	1	1978
BRZ012	Taió	-50.0000	-27.2000	359	120	270	16	26.14	1.3	ITL	3	1.9	0.4	DB	L/FHP	1.0	50	14	1	1978
BRZ013	Tangará Serra	-56.8667	-14.5333	387	60	130	15	17.16	1.4	ITL	4	2.3	0.5	DB	L/FHP	1.0	39	12	1	1978
BRZ014	Uchoa	-49.1747	-20.9528	485	160	193	5	71.67	1.5	ITL	L/FTC	2.1	0.4	DB	L/FHP	1.0	151	25	1	1978
BRZ015	Jaguariuna	-46.9858	-22.7056	584	0	180	2	20.2	2.0	SBT	23	2.5	0.5	DB	L/FHP	1.0	50	15	1	1978
BRZ016	Monte Azul	-48.6861	-20.8444	508	0	200	2	27.3	2.7	SBT	4	2.5	0.5	DB	L/FHP	1.0	68	16	1	1978
BRZ017	Morro de Ferro - 38	-46.5614	-21.7878	1196	351	414	8	40.62	1.5	ITL	11	2.4	0.5	DB	L/FHP	7.0	97	23	1	1978
BRZ018	Pocos de Caldas	-46.5833	-21.8000	1196	189	302	14	39.04	1.5	ITL	88	2.3	0.5	DB	L/FHP	5.0	91	20	10	1978
BRZ019	Pocos de Caldas	-46.5833	-21.8000	1196	200	300	10	36.8	1.6	UMM	L/FTC	2.4	0.5	DB	L/FHP	5	88	20	1	1978
BRZ020	Eduardo Gomes	-35.2094	-5.7950	53	20	60	6	14.87	2.0	ITL	L/FTC	2.5	0.5	DB	L/FHP	1.0	37	10	1	1980
BRZ021	Macaiba	-35.3542	-5.8583	11	40	70	10	11.06	2.0	ITL	L/FTC	2.6	0.5	DB	L/FHP	1.0	29	12	1	1980
BRZ022	Mossoro	-37.3500	-5.1833	16	150	680	54	25.40	1.2	ITL	L/FTC	2.7	0.5	DB	L/FHP	1.0	69	15	4	1980

BRZ023	Natal Ponta Negra	-35.2167	-5.8000	30	55	105	11	10.09	1.0	ITL	L/FTC	2.7	0.5	DB	L/FHP	1.0	27	20	1	1980
BRZ024	Parazinho	-35.8167	-5.2250	71	160	500	50	20.69	1.2	ITL	L/FTC	2.9	0.6	DB	L/FHP	1.0	60	15	1	1980
BRZ025	Pedra Grande	-35.8750	-5.1542	25	430	550	13	12.90	2.0	ITL	L/FTC	2.9	0.6	DB	L/FHP	1.0	37	12	1	1980
BRZ026	S.J.Mipibu Lagoa	-35.1597	-6.0028	58	90	140	9	14.32	1.2	ITL	L/FTC	2.7	0.5	DB	L/FHP	1.0	39	12	1	1980
BRZ027	Taipú Fi	-35.5833	-5.6333	41	65	87	6	23.57	1.2	ITL	L/FTC	2.9	0.6	DB	L/FHP	1.0	68	15	1	1980
BRZ028	Apodi F.ria	-37.7989	-5.6642	67	0	35	5	50.8	5.1	SBT	L/FTC	2.6	0.5	DB	L/FHP	1.0	132	35	1	1980
BRZ029	Grossos Tibau	-37.2583	-4.9833	5	0	600	4	33.5	3.3	AQT	L/FTC	2.5	0.5	DB	L/FHP	1.0	84	20	1	1980
BRZ030	Alto Araguaia	-53.2153	-17.3147	692	100	150	11	38.16	2.0	ITL	11	2.7	0.5	HW	L/FHP	1.0	103	28	1	1980
BRZ031	Jucimeira	-55.0000	-16.0000	251	40	148	23	44.87	1.2	ITL	L/FTC	2.8	0.6	HW	L/FHP	1.0	126	23	1	1980
BRZ032	Nortelandia	-56.6833	-14.3500	280	56	145	20	28.41	1.2	ITL	4	2.0	0.4	DB	L/FHP	1.0	57	12	2	1980
BRZ033	Pocone	-56.6667	-16.2500	142	50	95	9	39.70	2.0	ITL	3	2.4	0.5	DB	L/FHP	1.0	95	20	1	1980
BRZ034	Ponte Branca	-52.6667	-16.5333	424	100	145	9	23.12	1.2	ITL	3	2.3	0.5	DB	L/FHP	1.0	53	15	1	1980
BRZ035	Rosario Oeste	-56.4167	-14.5833	192	90	152	14	15.89	1.2	ITL	4	2.5	0.5	DB	L/FHP	1.0	40	12	1	1980
BRZ036	Varzea Grande	-56.2167	-15.7000	190	100	147	11	21.08	1.2	ITL	6	2.8	0.6	DB	L/FHP	1.0	59	15	1	1980
BRZ037	Aguilhada	-36.8667	-10.7000	12	0	1330	2	19.0	1.9	BHT	5	2.2	0.4	DB	L/FHP	1.0	41	11	3	1980
BRZ038	Brejo Grande	-36.4500	-10.4333	12	0	1316	2	23.5	2.4	BHT	5	1.9	0.4	DB	L/FHP	1.0	44	13	8	1980
BRZ039	C.s.m. Campos	-36.1167	-9.7833	12	0	2291	2	25.9	2.6	BHT	5	2.5	0.5	DB	L/FHP	1.0	64	15	4	1980
BRZ040	Carmopolis	-37.0000	-10.6500	12	0	839	2	29.7	3.0	BHT	3	2.1	0.4	DB	L/FHP	1.0	62	14	220	1980
BRZ041	Coqueiro Seco	-35.7833	-9.6667	31	0	1178	2	32.4	3.2	BHT	3	2.0	0.4	DB	L/FHP	1.0	65	15	9	1980
BRZ042	Engenho Furado	-36.1833	-9.7667	13	0	1822	2	25.7	2.6	BHT	3	2.3	0.5	DB	L/FHP	1.0	59	14	43	1980
BRZ043	Fazenda Riachuelo	-36.2167	-9.8667	540	0	2146	2	27.7	2.8	BHT	L/FTC	2.4	0.5	DB	L/FHP	1.0	66	15	3	1980
BRZ044	Jequia	-35.9833	-9.8833	18	0	1812	11	26.3	2.6	BHT	12	2.0	0.4	DB	L/FHP	1.0	53	14	11	1980
BRZ045	Mato Grosso	-37.1167	-10.7000	12	0	676	9	28.0	2.8	BHT	10	1.9	0.4	DB	L/FHP	1.0	53	14	9	1980
BRZ046	Pacatuba	-36.6500	-10.5000	12	0	2143	4	21.4	2.1	BHT	4	2.3	0.5	DB	L/FHP	1.0	49	13	4	1980
BRZ047	Piacabuçu	-36.3833	-10.4000	3	0	1331	18	23.0	2.3	BHT	19	2.0	0.4	DB	L/FHP	1.0	46	12	18	1980
BRZ048	Ponta Mangues	-36.6167	-10.5333	12	0	1486	6	25.0	2.5	BHT	4	2.3	0.5	DB	L/FHP	1.0	57	15	5	1980
BRZ049	Riachuelo	-37.1667	-10.6833	12	0	496	64	37.0	3.7	BHT	103	1.9	0.4	DB	L/FHP	1.0	70	17	64	1980

BRZ050	Rio São Francisco	-36.3500	-10.4500	12	0	2685	5	22.0	2.2	BHT	5	2.1	0.4	DB	L/FHP	1.0	46	12	5	1980
BRZ051	S.M. dos Campos	-36.1000	-9.8333	12	0	2469	15	28.1	2.8	BHT	11	2.5	0.5	DB	L/FHP	1.0	70	15	11	1980
BRZ052	Siririzinho	-37.0833	-10.6500	12	0	500	112	35.2	3.5	BHT	69	2.1	0.4	DB	L/FHP	1.0	74	18	69	1980
BRZ053	Tigre	-36.6500	-10.5833	12	0	1775	4	26.8	2.7	BHT	4	2.2	0.4	DB	L/FHP	1.0	59	14	4	1980
BRZ054	Tr. Riachuelo	-37.2667	-10.7333	12	0	504	15	37.0	3.7	BHT	15	1.9	0.4	DB	L/FHP	1.0	70	16	15	1980
BRZ055	Tres Martins	-35.7333	-9.6167	12	0	1451	2	25.7	2.6	BHT	26	2.0	0.4	DB	L/FHP	1.0	51	13	26	1980
BRZ056	Vila da Flor	-37.0333	-10.7500	12	0	854	5	30.7	3.1	BHT	5	2.3	0.5	DB	L/FHP	1.0	70	15	5	1980
BRZ057	Americano do Brasil	-50.0833	-16.2333	245	40	180	14	13.74	1.1	ITL	32	2.6	0.5	DB	L/FHP	2.0	35	12	2	1980
BRZ058	Arraial	-42.8333	-12.5000	592	112	176	8	14.03	1.2	ITL	20	3.5	0.7	DB	4	2.0	48	12	2	1980
BRZ059	Cachoeira Itapemirim	-41.1000	-20.8500	36	110	160	6	11.90	1.1	ITL	7	2.3	0.5	DB	1	3.0	27	15	1	1980
BRZ060	Cana Brava	-48.2333	-13.5333	400	40	224	20	17.64	1.3	ITL	23	2.6	0.5	DB	L/FHP	2.0	46	15	1	1980
BRZ061	Caraiba	-39.8358	-9.4700	400	120	424	44	14.52	1.1	ITL	70	2.8	0.6	DB	10	0.8	41	12	20	1980
BRZ062	Curiuva	-50.4583	-24.0333	776	50	132	11	19.71	1.1	ITL	10	2.8	0.6	DB	L/FHP	1.0	55	12	1	1980
BRZ063	Currais Novos	-36.5833	-6.3333	307	300	532	25	28.83	1.5	ITL	35	2.9	0.6	DB	22	3.3	83	15	5	1980
BRZ064	Jacobina	-40.5000	-11.2500	752	207	562	36	9.26	0.9	ITL	32	3.4	0.7	DB	L/FHP	2.0	31	10	11	1980
BRZ065	Morro Agudo	-46.8333	-17.5000	600	150	248	11	14.73	1.2	ITL	3	2.9	0.6	DB	1 .	9.0	43	12	5	1980
BRZ066	Niqelandia	-48.3000	-14.2167	583	30	138	10	13.28	1.2	ITL	10	2.1	0.4	DB	L/FHP	2.0	28	12	2	1980
BRZ067	Poco de Fora	-39.8556	-9.6889	366	84	230	20	20.06	1.3	ITL	5	2.7	0.5	DB	L/FHP	2.0	54	15	1	1980
BRZ068	Ponta Grossa	-50.3167	-23.3167	759	60	208	16	33.45	1.5	ITL	L/FTC	2.5	0.5	DB	L/FHP	1.0	84	15	1	1980
BRZ069	Santa Luz	-38.5667	-11.2000	374	100	200	10	8.88	0.9	ITL	41	3.2	0.6	DB	L/FHP	1.0	28	12	1	1980
BRZ070	Sapopema	-50.5803	-23.9108	753	40	160	13	38.97	1.5	ITL	5	2.8	0.6	DB	L/FHP	1.0	109	22	1	1980
BRZ071	Vazante	-46.7500	-18.0000	680	120	280	17	11.55	1.2	ITL	13	3.1	0.6	DB	2	1.1	36	15	1	1980
BRZ072	Caraiba	-39.8358	-9.4700	400	450	600	10	12.3	0.6	UMM	L/FTC	2.9	0.6	DB	L/FHP	1	36	10	1	1980
BRZ073	Currais Novos	-36.5833	-6.3333	114	300	370	8	22.6	1.0	UMM	L/FTC	2.9	0.6	DB	L/FHP	1	66	12	1	1980
BRZ074	Nova Lima	-43.8500	-19.9833	800	580	2182	22	14.6	2.0	UMM	28	3.8	0.8	DB	17	0.7	56	14	1	1980
BRZ075	Bico de Pedra	-43.6000	-20.4417	1410	0	75	16	14.4	1.4	SBT	8	3.4	0.7	HW	2	7.0	49	13	1	1980
BRZ076	Figueira	-50.4167	-24.0000	753	0	60	7	18.4	1.8	SBT	10	2.4	0.5	DB	3	3.8	44	12	5	1980
BRZ077	Apodi Sede	-37.7989	-5.6642	67	20	90	10	31.15	1.3	ITL	L/FTC	2.6	0.5	HW	L/FHP	1.0	81	15	1	1980

BRZ078	Macau	-36.6333	-5.1167	4	100	340	25	39.06	1.7	ITL	L/FTC	2.6	0.5	HW	L/FHP	1.0	102	22	1	1980
BRZ079	Santa Rita	-34.9781	-7.1139	16	270	330	13	15.88	1.1	ITL	L/FTC	2.5	0.5	HW	L/FHP	1.0	40	14	1	1980
BRZ080	Baia de Traicao	-34.9358	-6.6883	2	0	90	2	30.3	3.0	SBT	L/FTC	2.5	0.5	DB	L/FHP	1.0	76	16	1	1980
BRZ081	Lucena	-34.8689	-6.9003	3	0	95	2	25.9	2.6	SBT	L/FTC	2.5	0.5	DB	L/FHP	1.0	65	16	1	1980
BRZ082	Antenor Navarro	-38.4489	-6.7292	243	0	200	2	30.0	3.0	AQT	L/FTC	2.5	0.5	DB	L/FHP	1.0	75	21	1	1980
BRZ083	Monteiro	-37.1167	-7.8833	609	0	600	2	30.0	3.0	AQT	L/FTC	2.5	0.5	DB	L/FHP	1.0	75	21	1	1980
BRZ084	Agua Grande	-38.3652	-12.5044	50	0	1753	61	19.1	1.9	BHT	13	2.6	0.5	HW	13	1.5	49	12	231	1981
BRZ085	Aracas	-38.2003	-12.2477	66	0	3092	76	20.4	2.0	BHT	13	2.7	0.5	HW	13	1.5	54	15	149	1981
BRZ086	Buracica	-38.4667	-12.2167	50	520	895	35	24.7	2.5	BHT	13	2.6	0.5	HW	13	1.5	63	14	138	1981
BRZ087	Fazenda Imbé	-38.0167	-12.0333	50	0	3923	39	19.5	2.0	BHT	6	2.4	0.5	HW	11	1.5	47	12	42	1981
BRZ088	Miranga	-38.2000	-12.3500	113	0	3105	127	14.0	1.4	BHT	7	2.7	0.5	HW	13	1.5	37	13	231	1981
BRZ089	Taquipe	-38.4667	-12.4667	110	0	2011	123	25.9	2.6	BHT	8	2.4	0.5	HW	L/FHP	1.0	62	15	123	1981
BRZ090	Cornelio Procopio	-50.6392	-23.1900	624	40	175	10	27.80	1.5	ITL	L/FTC	2.1	0.4	HW	L/FHP	1.0	58	13	1	1982
BRZ091	Londrina	-51.1628	-23.3103	585	0	968	2	31.0	3.1	AQT	L/FTC	2.1	0.4	DB	L/FHP	1.0	65	15	1	1982
BRZ092	Olimpia	-48.9167	-20.7500	506	220	600	39	22.67	1.2	ITL	L/FTC	2.0	0.4	HW	L/FHP	1.0	45	12	1	1982
BRZ093	Pedreira	-46.9000	-22.7500	590	30	90	29	10.16	1.1	ITL	23	2.9	0.6	HW	L/FHP	1.0	29	12	1	1982
BRZ094	Votuporang	-49.9667	-20.4167	525	200	410	22	31.58	2.0	ITL	L/FTC	2.1	0.4	HW	L/FHP	1.0	66	15	1	1982
BRZ095	Monte Alto	-48.5000	-21.2667	735	0	464	2	30.6	3.1	AQT	L/FTC	2.1	0.4	DB	L/FHP	1.0	64	20	1	1982
BRZ096	Pinda	-45.3833	-22.8667	540	0	730	2	33.2	3.3	AQT	L/FTC	2.5	0.5	DB	L/FHP	1.0	83	20	1	1982
BRZ097	Taubate ONSEN	-45.6333	-23.0833	587	0	490	2	55.1	5.5	AQT	L/FTC	2.2	0.4	DB	L/FHP	1.0	121	25	1	1982
BRZ098	Dourados	-54.8128	-22.2681	450	0	4162	2	26.4	2.6	BHT	17	2.6	0.5	HW	L/FHP	1.0	69	15	1	1982
BRZ099	Guarapuava	-51.6600	-25.3100	1098	0	3650	2	28.3	2.8	BHT	L/FTC	2.8	0.6	HW	L/FHP	1.0	79	18	1	1982
BRZ100	Piratuba	-51.7794	-27.4242	437	0	2271	2	25.5	2.6	BHT	10	2.4	0.5	HW	L/FHP	1.0	61	15	1	1982
BRZ101	Almerim	-52.6328	-1.5328	65	0	2551	2	25.3	2.5	BHT	5	1.9	0.4	HW	L/FHP	1.0	48	12	1	1982
BRZ102	Andira (Barreirinh)	-57.0878	-3.3017	19	0	3580	2	15.2	1.5	BHT	5	2.1	0.4	HW	L/FHP	1.0	32	12	1	1982
BRZ103	Jacarezinho	-49.8700	-23.2200	505	0	2684	2	26.3	2.6	BHT	L/FTC	2.6	0.5	HW	L/FHP	1.0	68	16	1	1982
BRZ104	Presidente Prudente	-51.4000	-22.1333	475	150	230	9	36.70	1.5	ITL	L/FTC	2.1	0.4	HW	L/FHP	1.0	77	15	1	1983
BRZ105	Batatais	-47.5850	-20.8911	862	0	260	2	20.2	2.0	SBT	L/FTC	2.1	0.4	HW	L/FHP	1.0	42	12	1	1983
BRZ106	Bauru	-49.0606	-22.3147	526	0	60	2	36.7	3.7	SBT	L/FTC	2.1	0.4	HW	L/FHP	1.0	77	17	1	1983

BRZ107	Brotas	-48.1267	-22.2842	647	0	150	2	18.1	1.8	SBT	L/FTC	2.1	0.4	HW	L/FHP	1.0	38	12	1	1984
BRZ108	Ibira	-49.2408	-21.0803	446	0	80	2	23.9	2.4	SBT	L/FTC	2.5	0.5	HW	L/FHP	1.0	60	13	1	1984
BRZ109	Cassia de Coqueiros	-47.1697	-21.2828	890	0	140	2	20.3	2.0	SBT	L/FTC	2.1	0.4	HW	L/FHP	1.0	43	11	1	1984
BRZ110	Jaboticabal	-48.3222	-21.2547	605	0	200	2	21.5	2.1	SBT	L/FTC	2.5	0.5	HW	L/FHP	1.0	54	11	1	1984
BRZ111	Cacapava	-45.7069	-23.1008	560	40	136	49	22.31	1.2	ITL	L/FTC	2.5	0.5	HW	L/FHP	1.0	56	15	1	1986
BRZ112	Cacapava	-45.7069	-23.1008	560	0	197	8	48.0	4.8	SBT	L/FTC	2.5	0.5	HW	L/FHP	1.0	120	23	1	1986
BRZ113	Cruzeiro	-44.9167	-22.7167	587	0	490	2	49.0	4.9	SBT	L/FTC	2.2	0.4	HW	L/FHP	1.0	108	24	1	1986
BRZ114	Guara P49	-45.2233	-22.7964	539	172	200	11	131.20	2.0	ITL	L/FTC	2.5	0.5	HW	L/FHP	1.0	328	50	1	1986
BRZ115	Jacarei	-45.9556	-23.2956	613	150	268	59	22.41	1.2	ITL	L/FTC	2.7	0.5	HW	L/FHP	2.0	60	15	1	1986
BRZ116	Jacarei	-46.0092	-23.3042	613	0	84	10	29.3	2.9	SBT	L/FTC	2.5	0.5	HW	L/FHP	1.0	73	16	1	1986
BRZ117	Lorena P22	-45.1167	-22.7167	524	0	214	81	29.3	2.9	SBT	L/FTC	2.2	0.4	HW	L/FHP	1.0	64	15	1	1986
BRZ118	Piquete	-45.2500	-22.6167	645	0	88	2	22.2	2.2	SBT	L/FTC	2.4	0.5	HW	L/FHP	1.0	53	15	1	1986
BRZ119	S.Jose dos Campos	-45.7833	-22.9333	620	70	83	8	26.04	1.2	ITL	L/FTC	2.2	0.4	HW	L/FHP	1.0	57	12	1	1986
BRZ120	Sao Luiz de Paraitinga	-45.2000	-23.1333	760	50	87	11	26.39	1.2	ITL	L/FTC	2.7	0.5	HW	L/FHP	1.0	71	15	1	1986
BRZ121	Santa Isabel	-46.2214	-23.3156	640	108	114	**5**	15.20	1.2	ITL	L/FTC	3.0	0.6	HW	L/FHP	1.0	46	15	1	1986
BRZ122	Santa Isabel	-46.0139	-23.2833	640	0	114	2	23.3	2.3	SBT	L/FTC	2.4	0.5	HW	L/FHP	1.0	56	14	1	1986
BRZ123	Bariri	-48.7333	-22.0667	447	0	131	2	26.0	2.6	AQT	L/FTC	2.1	0.4	DB	L/FHP	1.0	55	15	1	1986
BRZ124	Barretos	-48.5667	-20.5333	530	0	600	2	25.0	2.5	AQT	L/FTC	2.1	0.4	DB	L/FHP	1.0	53	17	1	1986
BRZ125	Catanduva	-48.9667	-21.1333	503	0	457	2	27.4	2.7	AQT	L/FTC	2.1	0.4	DB	L/FHP	1.0	57	20	1	1986
BRZ126	Fernandópo lis	-50.2500	-20.2833	541	0	1285	2	28.6	2.9	AQT	L/FTC	2.1	0.4	DB	L/FHP	1.0	60	15	1	1986
BRZ127	Lins	-49.7333	-21.6667	437	0	700	15	23.1	2.3	AQT	L/FTC	2.1	0.4	DB	L/FHP	1.0	49	17	1	1986
BRZ128	Novo Horizonte	-49.2167	-21.4833	447	0	420	43	27.4	2.7	AQT	L/FTC	2.1	0.4	DB	L/FHP	1.0	57	18	1	1986
BRZ129	Paraguaçu Paulista	-50.5667	-22.4167	506	0	964	2	27.0	2.7	AQT	L/FTC	2.1	0.4	DB	L/FHP	1.0	57	16	1	1986
BRZ130	SJ Rio Preto	-49.3794	-20.8197	489	0	790	2	27.0	2.7	AQT	L/FTC	2.1	0.4	DB	L/FHP	1.0	57	20	1	1986
BRZ131	Tres lagoas	-51.7167	-20.7667	310	0	1800	2	30.6	3.1	AQT	L/FTC	2.5	0.5	DB	L/FHP	1.0	77	20	1	1986
BRZ132	Caetite	-42.5000	-14.0667	1020	90	170	9	8.17	0.9	ITL	11	2.3	0.5	HW	L/FHP	2.0	19	12	5	1987
BRZ133	J.Camara F.S.Verde	-35.8197	-5.5375	160	150	282	23	27.94	1.2	ITL	L/FTC	2.9	0.6	HW	L/FHP	1.0	81	21	1	1987
BRZ134	Jandaira	-36.0278	-5.4375	110	100	220	25	27.74	1.2	ITL	L/FTC	2.8	0.6	HW	L/FHP	2.0	78	22	2	1987
BRZ135	Agua Branca SP	-46.7008	-23.5719	770	120	243	11	24.38	1.2	ITL	8	1.7	0.3	HW	L/FHP	2.0	41	12	5	1987

BRZ136	Agua Funda SP	-46.6236	-23.6358	765	130	230	11	23.32	1.1	ITL	18	3.0	0.6	HW	18	2.7	70	15	2	1987
BRZ137	Castro	-50.0119	-24.7911	999	100	200	11	10.90	1.0	ITL	L/FTC	3.0	0.6	HW	L/FHP	1.0	33	12	1	1987
BRZ138	Autas Mirim	-59.7928	-3.2919	90	0	2248	2	22.1	2.2	BHT	5	2.3	0.5	HW	L/FHP	1.0	51	14	1	1987
BRZ139	Benjamin Constante	-69.9486	-4.3958	65	0	1425	2	24.0	2.4	BHT	5	2.4	0.5	HW	L/FHP	1.0	59	14	1	1987
BRZ140	Brasilia Leg	-55.8008	-3.9608	??	0	1354	2	16.8	1.7	BHT	5	1.9	0.4	HW	L/FHP	1.0	32	13	1	1987
BRZ141	Buiussu	-55.2292	-3.3958	20	0	2405	2	26.1	2.6	BHT	**5**	2.2	0.4	HW	L/FHP	1.0	57	15	1	1987
BRZ142	Cadajas	-62.1414	-3.4383	47	0	2027	2	23.6	2.4	BHT	5	1.9	0.4	HW	L/FHP	1.0	44	13	1	1987
BRZ143	Cumina Mirim	-55.9408	-1.3058	528	0	1090	2	14.8	1.5	BHT	4	1.8	0.4	HW	L/FHP	1.0	27	12	1	1987
BRZ144	Eirunepe	-69.8022	-6.6936	124	0	1192	2	28.0	2.8	BHT	3	2.2	0.4	HW	L/FHP	1.0	62	16	1	1987
BRZ145	Faro	-56.3806	-2.2236	202	0	3871	2	27.5	2.8	BHT	3	1.9	0.4	HW	L/FHP	1.0	52	14	1	1987
BRZ146	Fonte Boa	-66.0808	-3.5175	62	0	2087	2	20.0	2.0	BHT	L/FTC	2.1	0.4	HW	L/FHP	1.0	42	12	1	1987
BRZ147	Fordlandia	-55.4494	-3.7689	28	0	1735	2	26.6	2.7	BHT	3	2.0	0.4	HW	L/FHP	1.0	53	14	1	1987
BRZ148	Foz do Gregório	-70.6333	-6.8000	191	0	1992	2	32.0	3.2	BHT	4	2.7	0.5	HW	L/FHP	1.0	86	17	1	1987
BRZ149	Gurupa	-51.3750	-1.1750	20	0	1910	2	18.4	1.8	BHT	3	2.2	0.4	HW	L/FHP	1.0	40	12	1	1987
BRZ150	Ilha do Meio	-55.4061	-2.9253	154	0	1821	2	18.3	1.8	BHT	3	2.2	0.4	HW	L/FHP	1.0	40	12	1	1987
BRZ151	Ilha Grande Tarará	-54.8286	-2.1075	207	0	2041	2	22.7	2.3	BHT	3	2.2	0.4	HW	L/FHP	1.0	50	13	1	1987
BRZ152	Ilha Trindade	-58.7283	-3.3275	49	0	3043	2	47.0	4.7	BHT	3	2.1	0.4	HW	L/FHP	1.0	99	21	1	1987
BRZ153	Ipixuna	-72.3061	-7.2331	190	0	2204	2	21.0	2.1	BHT	3	2.8	0.6	HW	L/FHP	1.0	59	13	1	1987
BRZ154	Jacarezinho	-50.7094	**-1.0172**	121	0	2374	2	36.0	3.6	BHT	L/FTC	2.0	0.4	HW	L/FHP	1.0	72	16	1	1987
BRZ155	Jacunda	-50.4222	-1.9556	108	0	1425	2	19.5	2.0	BHT	3	2.0	0.4	HW	L/FHP	1.0	39	12	1	1987
BRZ156	Jaquirana	-73.1064	-6.2519	191	0	3162	2	23.0	2.3	BHT	3	3.1	0.6	HW	L/FHP	1.0	71	15	1	1987
BRZ157	Jarauacu	-52.9411	-2.7383	123	0	1910	2	16.0	1.6	BHT	3	2.1	0.4	HW	L/FHP	1.0	34	12	1	1987
BRZ158	Lago do Faro	-56.9714	-1.9556	74	0	3151	2	19.2	1.9	BHT	3	1.9	0.4	HW	L/FHP	1.0	36	11	1	1987
BRZ159	Lago Gurupá	-59.7067	-3.2419	61	0	1441	2	24.5	2.5	BHT	3	1.9	0.4	HW	L/FHP	1.0	47	11	1	1987
BRZ160	Lago Manaquir	-60.5833	-3.5183	44	0	1974	2	18.0	1.8	BHT	3	2.0	0.4	HW	L/FHP	1.0	36	11	1	1987
BRZ161	Manacapur	-60.6039	-3.2586	60	0	1137	2	20.5	2.1	BHT	3	2.2	0.4	HW	L/FHP	1.0	45	12	1	1987
BRZ162	Manaus	-60.0125	-2.9486	92	0	1501	2	23.4	2.3	BHT	3	2.3	0.5	HW	L/FHP	1.0	54	14	1	1987
BRZ163	Maues	-57.5756	-4.3067	25	0	1657	2	20.8	2.1	BHT	3	2.2	0.4	HW	L/FHP	1.0	46	12	1	1987

BRZ164	Monte Alegre	-54.3308	-2.1100	38	0	3055	2	21.2	2.1	BHT	3	1.7	0.3	HW	L/FHP	1.0	36	12	1	1987
BRZ165	Monuru	-56.4054	-3.3243	107	0	3000	2	14.0	1.4	BHT	3	2.0	0.4	HW	L/FHP	1.0	28	11	1	1987
BRZ166	Nhamunda	-57.3667	-1.7167	61	0	1957	2	16.3	1.6	BHT	3	2.0	0.4	HW	L/FHP	1.0	33	11	1	1987
BRZ167	Nova Olinda	-59.1058	-3.9103	32	0	2810	2	26.5	2.7	BHT	3	2.2	0.4	HW	L/FHP	1.0	58	14	1	1987
BRZ168	Oriximina	-55.8917	-1.7250	46	0	3097	2	26.3	2.6	BHT	3	1.8	0.4	HW	L/FHP	1.0	47	12	1	1987
BRZ169	P.Autas Mirim	-59.8933	-3.2714	60	0	1358	2	22.1	2.2	BHT	3	1.9	0.4	HW	L/FHP	1.0	42	13	1	1987
BRZ170	Parana Carreiro	-59.5561	-3.1964	64	0	1574	2	15.1	1.5	BHT	3	2.0	0.4	HW	L/FHP	1.0	30	11	1	1987
BRZ171	Parana Maiana	-45.3903	-3.6167	178	0	436	2	40.2	4.0	BHT	L/FTC	2.8	0.6	HW	L/FHP	1.0	113	22	1	1987
BRZ172	Portel	-50.8833	-1.9667	19	0	976	2	24.0	2.4	BHT	3	2.0	0.4	HW	L/FHP	1.0	48	12	1	1987
BRZ173	Rio Abacaxis	-58.2100	-4.4208	56	0	3750	2	19.0	1.9	BHT	3	2.2	0.4	HW	L/FHP	1.0	42	11	1	1987
BRZ174	Rio Apore	-50.0833	-1.2000	2	0	1467	2	23.0	2.3	BHT	L/FTC	2.6	0.5	HW	L/FHP	1.0	60	15	1	1987
BRZ175	Rio Arari	-58.2061	-3.6025	37	0	3998	2	26.1	2.6	BHT	3	2.2	0.4	HW	L/FHP	1.0	57	15	1	1987
BRZ176	Rio Batan	-73.1947	-6.8036	232	0	3747	2	22.5	2.3	BHT	3	2.3	0.5	HW	L/FHP	1.0	52	14	1	1987
BRZ177	Rio Curuá	-54.8083	-1.7583	132	0	1552	2	31.9	3.2	BHT	3	1.8	0.4	HW	L/FHP	1.0	57	13	1	1987
BRZ178	Rio Jarí	-52.3675	-1.0667	142	0	1629	2	21.0	2.1	BHT	3	2.0	0.4	HW	L/FHP	1.0	42	11	1	1987
BRZ179	Rio Juruá	-67.4681	-5.5000	119	0	1826	2	31.2	3.1	BHT	3	2.8	0.6	HW	L/FHP	1.0	87	18	1	1987
BRZ180	Rio Uatuma	-58.7117	-2.3478	68	0	1847	2	19.6	2.0	BHT	3	2.0	0.4	HW	L/FHP	1.0	39	11	1	1987
BRZ181	Rio Uraria	-58.7628	-3.8756	37	0	3768	2	22.4	2.2	BHT	3	2.2	0.4	HW	L/FHP	1.0	49	13	1	1987
BRZ182	Rio Urupadi	-57.1039	-4.3119	87	0	815	2	32.9	3.3	BHT	3	1.9	0.4	HW	L/FHP	1.0	63	15	1	1987
BRZ183	Rio Xingú	-51.9333	-2.6500	9	0	1300	2	22.9	2.3	BHT	3	2.0	0.4	HW	L/FHP	1.0	46	14	1	1987
BRZ184	Rosarinho	-59.1389	-3.6869	54	0	2576	2	21.6	2.2	BHT	3	2.2	0.4	HW	L/FHP	1.0	48	14	1	1987
BRZ185	Santo Antonio Iça	-67.9600	-3.1108	91	0	380	2	41.0	4.1	BHT	3	1.9	0.4	HW	L/FHP	1.0	78	16	1	1987
BRZ186	São Raimundo	-65.9458	-3.0069	56	0	1587	2	23.0	2.3	BHT	3	2.6	0.5	HW	L/FHP	1.0	60	15	1	1987
BRZ187	Taititu	-66.5342	-4.4008	96	0	2481	2	25.0	2.5	BHT	3	2.1	0.4	HW	L/FHP	1.0	53	13	1	1987
BRZ188	Tres Bocas	-62.8350	-4.9242	37	0	1283	2	17.0	1.7	BHT	3	1.7	0.3	HW	L/FHP	1.0	29	12	1	1987
BRZ189	Urubu	-58.8631	-3.0981	56	0	2651	2	15.9	1.6	BHT	3	2.2	0.4	HW	L/FHP	1.0	35	12	1	1987
BRZ190	Baturite	-38.8667	-4.3397	152	0	71	2	36.5	3.6	SBT	L/FTC	2.5	0.5	HW	L/FHP	1.0	91	25	1	1987
BRZ191	Caninde	-39.4880	-4.3028	148	0	77	2	50.4	5.0	SBT	L/FTC	2.5	0.5	HW	L/FHP	1.0	126	22	1	1987

BRZ192	Caridade	-39.1786	-4.2383	147	0	77	2	48.0	4.8	SBT	L/FTC	2.5	0.5	HW	L/FHP	1.0	120	23	1	1987
BRZ193	Crateus	-40.7067	-5.2211	297	0	77	2	47.1	4.7	SBT	L/FTC	2.5	0.5	HW	L/FHP	1.0	118	24	1	1987
BRZ194	Fortaleza	-38.5056	-3.7167	197	0	32	2	37.4	3.7	SBT	L/FTC	2.5	0.5	HW	L/FHP	1.0	94	26	1	1987
BRZ195	Maranguap	-38.7436	-4.3058	68	0	77	2	33.5	3.4	SBT	L/FTC	2.4	0.5	HW	L/FHP	1.0	81	27	1	1987
BRZ196	Paramoti	-39.2597	-4.0689	150	0	77	2	40.2	4.0	SBT	L/FTC	2.4	0.5	HW	L/FHP	1.0	97	24	1	1987
BRZ197	Quixada	-39.0503	-5.0917	193	0	77	2	44.0	4.4	SBT	L/FTC	2.4	0.5	HW	L/FHP	1.0	106	25	1	1987
BRZ198	Aguas de Lindóia	-46.6500	-22.4833	860	149	200	26	19.86	1.1	ITL	5	3.1	0.6	HW	L/FHP	2.0	62	15	1	1989
BRZ199	Amparo	-46.7667	-22.7167	674	142	204	33	18.06	1.1	ITL	15	3.3	0.7	HW	L/FHP	2.0	60	12	1	1989
BRZ200	Atibaia	-46.5500	-23.1167	803	58	148	46	13.38	1.2	ITL	L/FTC	3.1	0.6	HW	L/FHP	2.0	42	13	1	1989
BRZ201	Lindoia	-46.6500	-22.5167	677	58	92	17	10.93	1.0	ITL	12	3.1	0.6	HW	L/FHP	2.0	34	13	1	1989
BRZ202	Jaguariuna	-46.9833	-22.7000	584	150	174	12	71.37	2.0	ITL	L/FTC	2.5	0.5	HW	L/FHP	2.0	178	30	1	1989
BRZ203	Mogi Mirim	-46.9500	-22.4333	632	90	120	14	12.72	1.1	ITL	25	3.0	0.6	HW	L/FHP	1.0	38	12	1	1989
BRZ204	Monte Alegre	-46.7167	-22.7167	750	81	147	18	19.86	1.0	ITL	25	2.9	0.6	HW	L/FHP	1.0	58	15	1	1989
BRZ205	Serra Negra	-46.7000	-22.6167	840	120	184	32	23.32	1.0	ITL	30	2.9	0.6	HW	L/FHP	2.0	68	15	1	1989
BRZ206	Fernando de Noronha	-32.4167	-3.8500	5	20	51	16	18.20	2.0	ITL	L/FTC	2.0	0.4	HW	L/FHP	0.5	36	22	1	1990
BRZ207	Alcantara	-44.4264	-2.1967	32	0	1078	2	23.0	2.3	BHT	3	2.6	0.5	LS	L/FHP	1.0	60	14	2	1991
BRZ208	Caraibas	-45.9492	-7.5417	806	0	1933	2	19.0	1.9	BHT	L/FTC	2.5	0.5	LS	L/FHP	1.0	48	13	1	1991
BRZ209	Fazenda Meio	-46.1061	-8.2717	500	0	1821	2	29.3	2.9	BHT	L/FTC	2.6	0.5	LS	L/FHP	1.0	76	16	1	1991
BRZ210	Fazenda Ouro	-46.2508	-8.2342	540	0	1644	2	33.8	3.4	BHT	L/FTC	2.8	0.6	LS	L/FHP	1.0	95	21	1	1991
BRZ211	Imperatriz	-47.4961	-5.5217	116	0	2128	4	20.3	2.0	BHT	43	2.5	0.5	LS	L/FHP	1.0	51	12	1	1991
BRZ212	Mangabeira	-45.6933	-7.0414	225	0	2555	2	21.6	2.2	BHT	L/FTC	2.6	0.5	LS	L/FHP	1.0	56	13	1	1991
BRZ213	Mirador	-44.3167	-6.3833	186	0	2827	5	27.3	2.7	BHT	27	2.5	0.5	LS	L/FHP	1.0	68	14	1	1991
BRZ214	Norte Grajau	-46.1269	-5.8131	172	0	2573	4	20.5	2.0	BHT	35	2.7	0.5	LS	L/FHP	1.0	54	12	1	1991
BRZ215	P.Arco Ferrer	-44.4167	-3.3083	15	0	833	2	24.7	2.5	BHT	L/FTC	2.5	0.5	LS	L/FHP	1.0	62	15	1	1991
BRZ216	Pindaré Mirim	-45.3903	-3.6167	19	0	2162	4	29.2	2.9	BHT	27	2.5	0.5	LS	L/FHP	1.0	73	16	1	1991
BRZ217	Presidente Dutra	-44.5444	-5.3333	112	0	2842	2	24.3	2.4	BHT	L/FTC	2.9	0.6	LS	L/FHP	1.0	70	16	1	1991
BRZ218	Ribeiraozin ho	-46.0836	-8.0417	112	0	1836	2	16.0	1.6	BHT	L/FTC	3.0	0.6	LS	L/FHP	1.0	48	12	1	1991
BRZ219	Tem Medo	-46.9067	-8.7083	110	0	1688	2	15.1	1.5	BHT	L/FTC	2.8	0.6	LS	L/FHP	1.0	42	11	1	1991

BRZ220	Testa Branca	-46.1167	-7.3833	110	0	1605	2	22.8	2.3	BHT	L/FTC	3.4	0.7	LS	L/FHP	1.0	78	14	1	1991
BRZ221	Vargem Grande	-43.9783	-3.5508	43	0	1644	5	21.9	2.2	BHT	29	2.5	0.5	LS	L/FHP	1.0	55	14	1	1991
BRZ222	Vereda Boa	-46.3094	-7.4708	60	0	1940	2	23.2	2.3	BHT	L/FTC	2.7	0.5	LS	L/FHP	1.0	63	15	1	1991
BRZ223	Abelardo Luz SC	-52.1950	-26.4664	1014	0	3876	5	22.2	2.2	BHT	19	2.2	0.4	DB	L/FHP	1.0	49	12	1	1992
BRZ224	Aguas S.Pedro SP	-47.8100	-22.6700	460	0	1262	2	18.2	1.8	BHT	L/FTC	3.1	0.6	DB	L/FHP	1.0	56	14	1	1992
BRZ225	Alegrete (RS)	-55.7700	-28.8200	80	0	2044	2	17.1	1.7	BHT	21	2.5	0.5	DB	L/FHP	1.0	42	12	1	1992
BRZ226	Alto Garças MT	-53.5333	-16.9167	750	0	1947	2	26.1	2.6	BHT	18	3.0	0.6	DB	L/FHP	1.0	78	16	1	1992
BRZ227	Alto Taquari	-53.2600	-17.8700	850	0	2021	2	21.4	2.1	BHT	9	2.5	0.5	DB	L/FHP	1.0	54	12	1	1992
BRZ228	Amadeu Amaral	-50.0417	-22.3022	432	0	2992	4	23.1	2.3	BHT	L/FTC	2.2	0.4	DB	L/FHP	1.0	50	13	1	1992
BRZ229	Amambai (MT)	-55.2417	-23.1000	550	0	3371	2	29.5	3.0	BHT	8	2.2	0.4	DB	L/FHP	1.0	65	14	1	1992
BRZ230	Angulo (PR)	-51.9100	-23.0900	425	0	2787	2	32.6	3.3	BHT	L/FTC	1.8	0.4	DB	L/FHP	1.0	59	14	1	1992
BRZ231	Apucarana (PR)	-51.4215	-23.4969	823	0	4300	4	20.3	2.0	BHT	L/FTC	2.1	0.4	DB	L/FHP	1.0	42	12	1	1992
BRZ232	Atanasio (RS)	-51.6644	-28.7014	686	0	2251	2	25.7	2.6	BHT	58	2.0	0.4	DB	L/FHP	1.0	51	12	1	1992
BRZ233	Aracatuba (SP)	-50.3700	-21.1300	363	0	3605	2	22.0	2.2	BHT	11	2.2	0.4	DB	L/FHP	1.0	49	11	1	1992
BRZ234	Barra Nova (SC)	-49.7569	-27.5089	723	0	1101	3	30.6	3.1	BHT	16	2.7	0.5	DB	L/FHP	1.0	83	16	1	1992
BRZ235	Cacador SC	-50.8400	-26.8600	1098	0	1935	2	32.6	3.3	BHT	11	2.1	0.4	DB	L/FHP	1.0	68	14	1	1992
BRZ236	Campo Grande	-54.7192	-20.4858	510	0	2668	3	19.6	2.0	BHT	11	2.7	0.5	DB	L/FHP	1.0	53	12	1	1992
BRZ237	Campo Mourao	-52.4300	-24.1100	632	0	4455	2	22.9	2.3	BHT	L/FTC	2.0	0.4	DB	L/FHP	1.0	46	11	1	1992
BRZ238	Cândido Abreu	-52.4239	-24.4928	540	0	2792	12	25.7	2.6	BHT	L/FTC	2.1	0.4	DB	L/FHP	1.0	54	12	1	1992
BRZ239	Canoinhas (SC)	-50.5203	-26.3019	784	0	1775	2	25.4	2.5	BHT	9	2.8	0.6	DB	L/FHP	1.0	71	14	1	1992
BRZ240	CP-1-SP	-48.5100	-23.3800	683	0	1545	2	37.2	3.7	BHT	L/FTC	2.7	0.5	DB	L/FHP	1.0	100	22	1	1992
BRZ241	Cuiabá Paulista	-52.0486	-22.4000	387	0	4804	22	23.9	2.4	BHT	40	2.0	0.4	DB	L/FHP	1.0	48	14	1	1992
BRZ242	Dourados	-54.8243	-22.2800	450	0	4162	8	26.4	2.6	BHT	17	2.6	0.5	DB	L/FHP	1.0	69	15	1	1992
BRZ243	Guarapuava (PR)	-51.6600	-25.3100	985	0	3650	2	28.3	2.8	BHT	10	2.2	0.4	DB	L/FHP	1.0	62	14	1	1992
BRZ244	Guarei. (SP)	-48.2292	-23.4167	670	0	981	2	21.3	2.1	BHT	L/FTC	2.6	0.5	DB	L/FHP	1.0	55	13	1	1992
BRZ245	Herciliopoli (SC)	-52.0400	-26.6600	1065	0	3273	2	25.1	2.5	BHT	4	2.1	0.4	DB	L/FHP	1.0	53	13	1	1992

BRZ246	Herval Velho	-51.4600	-27.2200	825	0	2700	2	27.8	2.8	BHT	13	2.2	0.4	DB	L/FHP	1.0	61	15	1	1992
BRZ247	Itacurubi (RS)	-54.9917	-29.0167	356	0	2533	3	19.9	2.0	BHT	11	2.2	0.4	DB	L/FHP	1.0	44	12	1	1992
BRZ248	Jacarezinho (PR)	-49.8700	-23.2200	505	0	2684	2	26.3	2.6	BHT	L/FTC	2.6	0.5	DB	L/FHP	1.0	68	15	1	1992
BRZ249	Jatai (GO)	-51.7800	-17.8100	595	0	2107	2	24.2	2.4	BHT	L/FTC	2.8	0.6	DB	L/FHP	1.0	68	16	1	1992
BRZ250	Joaquim Tavora	-49.9600	-23.4700	574	0	2334	3	18.1	1.8	BHT	L/FTC	2.8	0.6	DB	L/FHP	1.0	51	13	1	1992
BRZ251	Lages - SC	-50.3700	-27.6400	408	0	1343	3	34.5	3.5	BHT	5	2.4	0.5	DB	L/FHP	1.0	83	18	1	1992
BRZ252	Lagoa Vermelha	-51.5258	-28.2086	684	0	2362	2	20.2	2.0	BHT	12	2.0	0.4	DB	L/FHP	1.0	40	12	1	1992
BRZ253	Laranjeiras	-52.4200	-25.4100	837	0	3968	3	25.5	2.6	BHT	L/FTC	2.1	0.4	DB	L/FHP	1.0	54	13	1	1992
BRZ254	Lins (SP)	-49.7561	-21.6922	412	0	3460	3	18.8	1.9	BHT	L/FTC	2.4	0.5	DB	L/FHP	1.0	45	11	1	1992
BRZ255	Machadinh	-51.6600	-27.5900	728	0	2715	2	27.9	2.8	BHT	11	2.1	0.4	DB	L/FHP	1.0	59	15	1	1992
BRZ256	Mallet (PR)	-50.7861	-25.8778	844	0	1861	3	28.1	2.8	BHT	L/FTC	2.7	0.5	DB	L/FHP	1.0	76	17	1	1992
BRZ257	Marcelino Ramos	-51.9300	-27.5300	367	0	2589	3	29.6	3.0	BHT	11	2.1	0.4	DB	L/FHP	1.0	62	15	1	1992
BRZ258	Monjolinho (PR)	-50.8706	-24.3744	834	0	2017	2	20.8	2.1	BHT	L/FTC	2.8	0.6	DB	L/FHP	1.0	58	15	1	1992
BRZ259	Muitos Capões PR	-51.0975	-28.3556	908	0	1967	2	27.8	2.8	BHT	11	2.1	0.4	DB	L/FHP	1.0	58	14	1	1992
BRZ260	Olimpia (SP)	-48.9278	-20.6875	495	0	2568	4	24.2	2.4	BHT	L/FTC	2.2	0.4	DB	L/FHP	1.0	53	14	1	1992
BRZ261	Ortigueira (PR)	-50.9000	-24.1700	733	0	2025	1	27.4	2.7	BHT	L/FTC	2.7	0.5	DB	L/FHP	1.0	74	16	1	1992
BRZ262	Paraguaçu Paulista	-50.6047	-22.4153	469	0	3663	2	18.5	1.9	BHT	L/FTC	2.3	0.5	DB	L/FHP	1.0	43	12	1	1992
BRZ263	Paranapane ma SP	-48.7744	-23.4353	609	0	1683	4	21.4	2.1	BHT	L/FTC	2.9	0.6	DB	L/FHP	1.0	62	13	2	1992
BRZ264	Petrolandia (SC)	-49.7400	-27.6000	930	0	1126	2	29.4	2.9	BHT	9	2.7	0.5	DB	L/FHP	1.0	79	13	1	1992
BRZ265	Piratuba (SC)	-51.7800	-27.4200	437	0	2271	3	25.5	2.6	BHT	10	2.1	0.4	DB	L/FHP	1.0	54	15	1	1992
BRZ266	Piratininga	-49.1522	-22.3839	568	0	2105	3	20.1	2.0	BHT	L/FTC	2.7	0.5	DB	L/FHP	1.0	54	15	2	1992
BRZ267	Pitanga (SP)	-47.6400	-22.5440	634	0	1228	3	32.2	3.2	BHT	L/FTC	2.8	0.6	DB	L/FHP	1.0	90	21	1	1992
BRZ268	Porto União (SC)	-51.0569	-26.2739	754	0	2336	2	23.2	2.3	BHT	10	2.6	0.5	DB	L/FHP	1.0	60	19	1	1992
BRZ269	Pres. Epitácio SP	-52.1019	-21.7583	254	0	3954	4	23.5	2.4	BHT	L/FTC	2.0	0.4	DB	L/FHP	1.0	47	12	1	1992
BRZ270	Quatigua (PR)	-49.9500	-23.6100	526	0	1386	2	19.3	1.9	BHT	L/FTC	2.9	0.6	DB	L/FHP	1.0	56	14	1	1992
BRZ271	Ronda Alta (RS)	-52.7700	-27.8400	645	0	3422	2	19.7	2.0	BHT	L/FTC	2.0	0.4	DB	L/FHP	1.0	39	12	1	1992

BRZ272	Reserva (PR)	-50.8833	-24.6250	918	0	1909	4	20.1	2.0	BHT	L/FTC	2.7	0.5	DB	L/FHP	1.0	54	13	1	1992
BRZ273	Rio Aporé (MS)	-52.4000	-18.9000	572	0	3474	3	15.9	1.6	BHT	13	2.4	0.5	DB	L/FHP	1.0	38	12	1	1992
BRZ274	Ribas Rio Pardo	-53.9500	-20.4200	411	0	3366	2	39.1	3.9	BHT	8	2.6	0.5	DB	L/FHP	1.0	102	25	1	1992
BRZ275	Rio Claro do Sul	-50.7000	-26.0100	810	0	1999	2	26.4	2.6	BHT	L/FTC	2.6	0.5	DB	L/FHP	1.0	69	21	1	1992
BRZ276	Rio Ivaí (RI RS)	-54.3800	-23.4664	151	0	2403	2	19.4	1.9	BHT	11	2.3	0.5	DB	L/FHP	1.0	45	12	1	1992
BRZ277	Santa Gertrudes	-47.5800	-22.5200	539	0	1335	2	23.9	2.4	BHT	L/FTC	2.9	0.6	DB	L/FHP	1.0	69	16	1	1992
BRZ278	S. Jeronimo Serra	-50.6400	-23.2800	1047	0	2346	3	26.5	2.7	BHT	L/FTC	2.4	0.5	DB	L/FHP	1.0	64	16	1	1992
BRZ279	Ivinhema (MT	-53.8700	-21.8800	281	0	3003	3	26.5	2.7	BHT	8	1.9	0.4	DB	L/FHP	1.0	50	14	1	1992
BRZ280	Tangara (SC)	-51.2500	-27.0800	639	0	2431	5	30.3	3.0	BHT	11	2.3	0.5	DB	L/FHP	1.0	70	17	1	1992
BRZ281	Tres Lagoas MT	-51.7500	-20.8800	310	0	4582	2	20.6	2.1	BHT	22	2.2	0.4	DB	L/FHP	1.0	45	12	1	1992
BRZ282	Taciba (SP)	-51.3414	-22.3333	496	0	4951	5	20.4	2.0	BHT	L/FTC	2.1	0.4	DB	L/FHP	1.0	43	12	1	1992
BRZ283	Torres (RS)	-49.8000	-29.3300	28	0	990	2	31.7	3.2	BHT	6	2.2	0.4	DB	L/FHP	1.0	70	15	1	1992
BRZ284	Alto Taquari	-53.2600	-17.8700	850	0	2021	2	21.4	2.1	BHT	L/FTC	2.5	0.5	DB	L/FHP	1.0	54	12	1	1992
BRZ285	Tres Pinheiros	-51.4336	-26.7131	1290	0	3002	2	18.7	1.9	BHT	12	2.2	0.4	DB	L/FHP	1.0	41	11	1	1992
BRZ286	Taquara Verde SC	-51.3200	-26.7400	1070	0	2235	11	24.3	2.4	BHT	L/FTC	2.1	0.4	DB	L/FHP	1.0	51	13	1	1992
BRZ287	União Vitória PR	-51.0333	-26.1917	768	0	2162	2	25.0	2.5	BHT	L/FTC	2.6	0.5	DB	L/FHP	1.0	65	14	1	1992
BRZ288	Nuporanga (PR)	-45.7542	-20.7303	775	165	250	17	30.58	1.2	ITL	15	2.1	0.4	HW	L/FHP	**1.0**	64	16	1	1999
BRZ289	Nuporanga (SF)	-45.7542	-20.7303	775	200	250	27	12.09	1.2	ITL	15	2.1	0.4	HW	L/FHP	**1.0**	25	16	1	1999
BRZ290	Sabara	-43.8069	-19.8858	1019	68	528	8	23.6	1.5	UM M	L/FTC	2.8	0.6	HW	L/FHP	2	66	17	1	2003
BRZ291	Rio Quente	-48.7475	-17.7765	680	0	500	3	47.0	4.7	AQT	L/FTC	2.8	0.6	PS	L/FHP	1.0	132	26	1	2003
BRZ292	Pirapetinga	-48.5810	-17.6904	686	0	400	2	57.5	5.8	AQT	L/FTC	2.8	0.6	PS	L/FHP	1.0	161	30	1	2003
BRZ293	Caldas Novas	-48.6251	-17.7361	685	0	350	2	40.0	4.0	AQT	L/FTC	2.8	0.6	PS	L/FHP	1.0	112	30	1	2003
BRZ294	Tucum	-49.6500	-17.8250	635	0	172	2	29.1	2.9	AQT	L/FTC	2.8	0.6	PS	L/FHP	1.0	81	25	1	2003
BRZ295	Bagre	-49.7040	-17.9500	630	0	400	2	42.5	4.3	AQT	L/FTC	2.8	0.6	PS	L/FHP	1.0	119	26	1	2003
BRZ296	Area 103	-48.3030	-17.8230	618	0	430	2	54.9	5.5	AQT	L/FTC	2.8	0.6	PS	L/FHP	1.0	154	33	1	2003
BRZ297	Angra dos Reis	-44.2833	-23.0333	6	30	60	16	41.41	2.0	ITL	11	2.6	0.5	PS	L/FHP	2.0	108	22	1	2005

BRZ298	Boa Vista (Campos)	-41.1028	-22.0183	13	52	100	25	26.38	2.0	ITL	7	2.2	0.4	PS	L/FHP	1.0	58	14	1	2005
BRZ299	Carapebus	-41.6656	-22.1869	15	58	90	16	7.97	0.8	ITL	4	2.2	0.4	PS	L/FHP	1.0	18	11	1	2005
BRZ300	Duas Barras P1	-42.5203	-22.0486	530	80	122	22	14.91	1.1	ITL	4	3.0	0.6	PS	L/FHP	1.0	45	15	1	2005
BRZ301	Maricá P2	-42.7519	-22.9014	5	50	100	26	10.97	1.0	ITL	6	2.7	0.5	PS	L/FHP	1.0	30	15	1	2005
BRZ302	Niterói (Cafuba)	-43.0672	-22.9333	5	74	116	22	14.24	1.1	ITL	4	3.0	0.6	PS	L/FHP	1.0	43	15	1	2005
BRZ303	Paraíba do Sul CA	-43.3167	-22.1500	275	70	100	25	11.13	1.2	ITL	5	2.8	0.6	PS	L/FHP	1.0	31	12	1	2005
BRZ304	Porciúncula	-41.9094	-20.8211	190	38	80	23	13.30	1.2	ITL	4	2.9	0.6	PS	L/FHP	1.0	39	14	1	2005
BRZ305	Rio Bonito	-42.5372	-22.7931	62	60	108	21	7.84	0.8	ITL	4	2.8	0.6	PS	L/FHP	1.0	22	20	1	2005
BRZ306	Sao Sebastião	-45.4167	-23.8000	25	130	188	31	16.42	1.1	ITL	13	3.2	0.6	PS	L/FHP	1.0	53	14	1	2005
BRZ307	S. Sebastiao Alto	-42.0994	-21.8231	575	96	116	11	7.02	1.1	ITL	4	2.8	0.6	PS	L/FHP	1.0	20	14	1	2005
BRZ308	Sapucaia	-42.7950	-22.0333	221	30	76	24	7.71	1.1	ITL	4	2.9	0.6	PS	L/FHP	1.0	22	15	1	2005
BRZ309	Saquarema	-42.5167	-22.8500	10	80	118	20	15.41	1.0	ITL	4	2.4	0.5	PS	L/FHP	1.0	37	16	1	2005
BRZ310	Teresópolis	-42.9444	-22.4333	871	100	148	25	15.56	1.0	ITL	4	2.9	0.6	PS	L/FHP	1.0	45	15	1	2005
BRZ311	UENF (Campos)	-41.1333	-21.9578	13	58	100	22	18.40	1.0	ITL	7	2.7	0.5	PS	L/FHP	1.0	50	15	1	2005
BRZ312	Vassouras	-43.5333	-22.3500	434	60	80	11	7.45	0.9	ITL	6	2.6	0.5	PS	L/FHP	1.0	19	12	1	2005
BRZ313	Cambuci (MV)	-41.9197	-21.4667	215	0	84	2	13.8	1.4	SBT	L/FTC	2.8	0.6	PS	L/FHP	1.0	39	13	1	2005
BRZ314	Cordeiro	-42.3689	-22.0169	485	0	36	2	19.8	2.0	SBT	L/FTC	2.5	0.5	PS	L/FHP	1.0	49	14	1	2005
BRZ315	Coronel Teixeira	-41.9197	-21.4672	60	0	76	2	19.0	1.9	SBT	L/FTC	2.6	0.5	PS	L/FHP	1.0	49	15	1	2005
BRZ316	Jaguarembé	-41.9667	-21.7133	60	0	100	2	17.2	1.7	SBT	L/FTC	2.6	0.5	PS	L/FHP	1.0	45	13	1	2005
BRZ317	Itatiaia	-44.5833	-22.5000	390	0	90	2	22.0	2.2	SBT	L/FTC	2.2	0.4	PS	L/FHP	1.0	45	12	1	2005
BRZ318	Laje de Muriaé	-42.1250	-21.2028	172	0	100	2	23.4	2.3	SBT	L/FTC	2.7	0.5	PS	L/FHP	1.0	63	16	1	2005
BRZ319	Miguel Pereira	-43.4667	-22.4667	618	0	80	2	21.1	2.1	SBT	L/FTC	2.7	0.5	PS	L/FHP	1.0	57	15	1	2005
BRZ320	Miracema	-42.2000	-21.4167	137	0	100	2	20.5	2.1	SBT	L/FTC	2.8	0.6	PS	L/FHP	1.0	57	15	1	2005
BRZ321	Jamapara	-42.7106	-21.9000	221	0	74	2	20.9	2.1	SBT	L/FTC	2.5	0.5	PS	L/FHP	1.0	52	*14*	1	2005
BRZ322	São Paulo HU	-46.7413	-23.5663	761	100	202	51	18.87	1.2	ITL	L/FTC	2.6	0.5	PS	L/FHP	1.0	49	15	1	2005
BRZ323	Bebedouro (Ana)	-48.4950	-21.0672	563	124	176	29	25.51	1.5	ITL	L/FTC	2.0	0.4	PS	L/FHP	1.0	51	14	1	2005
BRZ324	Bebedouro (Serra)	-48.4950	-21.0672	563	126	146	11	31.97	1.5	ITL	L/FTC	2.0	0.4	PS	L/FHP	1.0	64	14	1	2005

BRZ325	Bebedouro (Cruz)	-48.4950	-21.0672	563	130	154	13	36.01	1.5	ITL	L/FTC	2.0	0.4	PS	L/FHP	1.0	72	14	1	2005
BRZ326	Ilheus	-39.0714	-14.6279	8	0	1246	2	29.6	3.0	BHT	7	2.5	0.5	LS	13	1.5	74	15	1	2006
BRZ327	Mucuri	-39.6943	-18.1723	7	0	847	4	27.5	2.7	BHT	7	2.4	0.5	LS	13	1.5	66	14	3	2006
BRZ328	Serra Dourada	-44.0383	-12.9448	574	0	1014	2	23.5	2.3	BHT	L/FTC	2.5	0.5	LS	L/FHP	1.5	59	13	1	2006
BRZ329	Vera Cruz	-38.6239	-12.9624	64	0	1664	2	33.1	3.3	BHT	7	2.6	0.5	LS	13	1.5	86	17	1	2006
BRZ330	Agua Comprida	-48.1089	-20.0564	543	0	75	2	21.1	2.1	SBT	7	2.3	0.5	PS	L/FHP	1.0	48	12	1	2005
BRZ331	Botelhos	-46.3950	-21.6333	1008	0	65	2	26.2	2.6	SBT	6	2.6	0.5	PS	L/FHP	1.0	68	16	1	2005
BRZ332	Buritizeiro	-45.0872	-16.7268	633	0	1843	2	23.2	2.3	BHT	L/FTC	2.5	0.5	PS	L/FHP	1.0	58	13	1	2005
BRZ333	Cabo Verde	-46.3961	-21.4719	927	0	70	2	22.7	2.3	SBT	6	2.7	0.5	PS	L/FHP	1.0	61	17	1	2005
BRZ334	Cachoira Pageu	-41.6853	-16.0883	804	0	75	2	21.1	2.1	SBT	5	3.4	0.7	PS	L/FHP	1.0	72	18	1	2005
BRZ335	Cor. Fabriciano	-42.6253	-19.5100	250	0	75	2	23.7	2.4	SBT	5	2.6	0.5	PS	L/FHP	1.0	62	15	1	2005
BRZ336	Igarape	-44.3017	-20.0703	786	0	85	2	21.6	2.2	SBT	4	2.5	0.5	PS	L/FHP	1.0	54	14	1	2005
BRZ337	Itapagipe	-49.3814	-19.9016	490	0	75	2	28.8	2.9	SBT	4	1.9	0.4	PS	L/FHP	1.0	55	13	1	2005
BRZ338	Jpao Pinheiro	-46.3136	-17.6956	584	0	102	2	21.9	2.2	SBT	4	2.6	0.5	PS	L/FHP	1.0	57	13	1	2005
BRZ339	Mateus Leme	-44.4278	-19.9864	813	0	110	2	18.4	1.8	SBT	L/FTC	3.0	0.6	PS	L/FHP	1.0	55	14	1	2005
BRZ340	Nova Serrana	-44.9836	-19.8761	781	0	75	2	24.7	2.5	SBT	L/FTC	3.0	0.6	PS	L/FHP	1.0	74	17	1	2005
BRZ341	Piranga	-43.3003	-20.6847	620	0	78	2	22.8	2.3	SBT	6	2.7	0.5	PS	L/FHP	1.0	62	16	1	2005
BRZ342	Augusto de Lima	-44.0724	-18.0347	574	0	120	6	24.2	2.4	SBT	L/FTC	2.6	0.5	PS	L/FHP	1.0	63	15	1	2005
BRZ343	S. Franc. Sales	-49.7742	-19.8628	423	0	80	4	27.5	2.8	SBT	*5*	2.8	0.6	PS	L/FHP	1.0	77	19	1	2005
BRZ344	S. Gon. Rio Preto	-43.3881	-18.0042	742	0	82	7	21.6	2.2	SBT	6	1.9	0.4	PS	L/FHP	1.0	41	12	1	2005
BRZ345	Unai	-46.6008	-16.6000	575	0	102	2	21.9	2.2	SBT	4	2.7	0.5	PS	L/FHP	1.0	59	15	1	2005
BRZ346	Verissimo	-48.3083	-19.6633	674	0	63	2	17.0	1.7	SBT	L/FTC	2.5	0.5	PS	2.4	1.0	42	13	1	2008
BRZ347	Cascavel	-53.3717	-24.9511	669	218	238	11	35.93	2.0	ITL	L/FTC	2.0	0.4	PS	L/FHP	1.0	72	15	1	2008
BRZ348	Congoinhas	-50.5536	-22.5511	753	240	337	11	30.88	2.0	ITL	L/FTC	2.1	0.4	PS	L/FHP	1.0	65	15	1	2008
BRZ349	Curitiba	-49.2353	-25.4491	858	184	404	59	18.22	1.0	ITL	L/FTC	2.8	0.6	PS	L/FHP	1.0	51	12	1	2008
BRZ350	Lindoeste	-53.6449	-25.2616	382	88	102	8	24.11	1.2	ITL	L/FTC	2.1	0.4	PS	L/FHP	1.0	51	16	1	2008
BRZ351	Marechal Rondon	-54.0431	-24.5541	396	120	290	16	14.32	1.2	ITL	L/FTC	2.1	0.4	PS	L/FHP	1.0	30	15	1	2008
BRZ352	Medianeira	-54.0237	-25.2500	356	98	134	18	33.04	1.2	ITL	L/FTC	2.1	0.4	PS	L/FHP	1.0	69	16	1	2008

BRZ353	Nova Santa Rosa	-53.8928	-24.4325	339	84	122	20	26.57	1.2	ITL	L/FTC	2.1	0.4	PS	L/FHP	1.0	56	16	1	2008
BRZ354	Chapeu Sol (PR)	-51.9833	-24.9500	778	0	2465	4	19.3	1.9	BHT	L/FTC	2.3	0.5	PS	L/FHP	1.0	44	13	1	2008
BRZ355	Altonia (PR)	-53.8536	-23.8778	380	0	4933	2	20.5	2.1	BHT	L/FTC	2.7	0.5	PS	L/FHP	1.0	54	12	1	2008
BRZ356	Boa Esperança	-48.4167	-21.9833	775	0	1400	2	18.0	1.8	BHT	L/FTC	3.0	0.6	PS	L/FHP	1.0	54	12	1	2008
BRZ357	Esmeralda (RS)	-51.0853	-28.1200	922	0	2418	2	23.0	2.3	BHT	10	2.9	0.6	PS	L/FHP	1.0	67	16	1	2008
BRZ358	Lagoa Azul (SP)	-50.8047	-21.6667	438	0	4415	3	20.3	2.0	BHT	L/FTC	2.9	0.6	PS	L/FHP	1.0	59	15	1	2008
BRZ359	Matos Costa (PR)	-51.1172	-26.5875	1060	0	2718	2	27.8	2.8	BHT	13	2.5	0.5	PS	L/FHP	1.0	69	17	1	2008
BRZ360	Rio Jataí (GO)	-51.7806	-17.7317	696	0	1657	2	24.0	2.4	BHT	3	2.2	0.4	PS	L/FHP	1.0	53	14	1	2008
BRZ361	Rio Piqueri (PR)	-52.5339	-24.8111	1040	0	5337	2	26.1	2.6	BHT	L/FTC	2.1	0.4	PS	L/FHP	1.0	55	15	1	2008
BRZ362	Ronda Alta (RS)	-52.7558	-27.9111	651	0	3418	4	19.8	2.0	BHT	38	2.2	0.4	PS	L/FHP	1.0	44	12	1	2008
BRZ363	Seara (SC)	-52.2439	-27.1442	550	0	3828	3	20.5	2.1	BHT	4	2.6	0.5	PS	L/FHP	1.0	53	11	1	2008
BRZ364	Taquará Verde	-51.3158	-26.7436	1070	0	2966	2	24.3	2.4	BHT	12	2.3	0.5	PS	L/FHP	1.0	56	12	1	2008
BRZ365	Foz de Iguacu	-54.4818	-25.6057	267	0	843	2	26.1	2.6	AQT	L/FTC	2.1	0.4	PS	L/FHP	1.0	55	15	1	2008
BRZ366	Araguainha	-53.0325	-16.8561	460	85	150	14	20.76	1.2	ITL	5	2.3	0.5	PS	L/FHP	1.0	47	15	1	2009
BRZ367	Araranguá	-49.3970	-28.3930	220	100	130	4	27.80	1.0	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	79	21	2	2009
BRZ368	Araras	-47.3840	-22.3569	629	99	119	11	19.86	1.2	ITL	15	3.3	0.7	PS	L/FHP	1.0	66	20	1	2009
BRZ369	Batatais	-47.5833	-20.9000	862	20	80	29	16.25	1.2	ITL	L/FTC	2.1	0.4	PS	L/FHP	1.0	34	12	1	2009
BRZ370	Braganca Paulista	-46.5500	-22.9500	817	150	178	16	21.84	1.1	ITL	9	3.1	0.6	PS	L/FHP	2.0	68	15	1	2009
BRZ371	Butiá	-51.9000	-30.1667	71	60	200	15	31.45	1.1	ITL	19	2.8	0.6	PS	4	2.0	86	21	6	2009
BRZ372	Cosmopolis	-47.2000	-22.6333	652	150	210	31	35.59	2.0	ITL	13	1.9	0.4	PS	L/FHP	1.0	68	15	1	2009
BRZ373	Dourados	-48.3167	-22.1167	706	90	120	5	20.10	1.2	ITL	L/FTC	2.5	0.5	PS	L/FHP	1.0	50	12	1	2009
BRZ374	Itapira	-46.8167	-22.4333	643	121	141	12	16.03	1.2	ITL	33	2.9	0.6	PS	L/FHP	1.0	47	13	1	2009
BRZ375	Itapolis	-48.8167	-21.2667	481	90	180	10	28.44	1.2	ITL	L/FTC	2.1	0.4	PS	L/FHP	1.0	60	14	2	2009
BRZ376	Itu	-47.3000	-23.2667	583	100	140	19	26.66	1.2	ITL	80	2.9	0.6	PS	L/FHP	1.0	77	16	1	2009
BRZ377	Jau	-48.5500	-22.3000	522	140	195	7	19.29	1.2	ITL	L/FTC	2.5	0.5	PS	L/FHP	1.0	48	12	1	2009
BRZ378	Jundiai	-46.8667	-23.2000	761	120	172	27	21.08	1.2	ITL	22	2.9	0.6	PS	L/FHP	2.0	61	12	1	2009
BRZ379	Lauro Muller	-49.5000	-28.6667	220	80	130	6	26.71	1.1	ITL	6	2.1	0.4	PS	L/FHP	1.0	56	13	1	2009

BRZ380	Papanduva	-50.1333	-26.3833	788	100	300	21	22.70	1.1	ITL	40	3.1	0.6	PS	3	1.3	70	15	3	2009
BRZ381	Praia do Rincao	-49.3500	-28.8000	48	130	166	5	32.88	2.0	ITL	11	2.2	0.4	PS	L/FHP	1.0	72	16	1	2009
BRZ382	Rafard	-47.5167	-23.0000	515	100	170	36	21.37	1.0	ITL	13	2.9	0.6	PS	L/FHP	1.0	62	15	1	2009
BRZ383	Rio Pardo	-52.3500	-30.0167	47	130	330	21	41.00	2.0	ITL	4	2.5	0.5	PS	L/FHP	1.0	104	21	1	2009
BRZ384	Cuiaba PT-15	-55.9725	-15.6390	225	90	120	9	43.61	1.0	ITL	L/FTC	2.5	0.5	PS	L/FHP	1.0	109	20	1	2012
BRZ385	Cuiaba PT-64	-55.0292	-15.5471	208	96	170	15	29.33	1.0	ITL	L/FTC	2.5	0.5	PS	L/FHP	1.0	73	17	1	2012
BRZ386	Aragacema	-49.3737	-8.7411	159	68	140	17	16.88	1.0	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	49	12	1	2019
BRZ387	Barra da Aroeira	-47.7116	-10.2791	345	64	115	12	33.31	1.0	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	97	15	1	2019
BRZ388	Cariri P2	-49.1546	-11.8918	295	68	100	9	10.41	1.0	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	30	15	1	2019
BRZ389	Chapada	-47.7465	-11.6099	350	52	115	15	27.66	1.0	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	80	14	1	2019
BRZ390	Conc. Tocantins	-47.2869	-12.2270	394	68	100	9	20.03	1.0	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	58	15	1	2019
BRZ391	Divinopolis	-49.2097	-9.8018	256	56	115	15	16.88	1.0	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	48	16	1	2019
BRZ392	Duere	-49.2689	-11.3369	235	48	96	12	22.00	1.0	ITL	L/FTC	3.0	0.6	PS	L/FHP	1.0	66	15	1	2019
BRZ393	Lagoa Confusao	-49.6085	-10.7778	200	76	140	17	11.60	1.0	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	34	12	1	2019
BRZ394	Natividade 1	-47.7213	-11.7085	354	48	96	13	11.76	1.0	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	34	13	1	2019
BRZ395	Natividade 2	-47.7243	-11.7154	322	48	115	15	25.68	1.0	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	74	16	1	2019
BRZ396	Nova Olinda	-48.4210	-7.6280	257	44	120	18	22.36	1.0	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	65	15	1	2019
BRZ397	Nova Rosalandia	-48.9158	-10.5632	255	48	136	20	13.46	1.2	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	39	12	1	2019
BRZ398	Paraiso	-48.8976	-10.1752	411	48	110	16	19.91	1.2	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	58	15	1	2019
BRZ399	Porto Nacional	-48.3879	-10.7353	212	80	96	5	43.86	1.2	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	127	22	1	2019
BRZ400	Praia Norte	-47.8133	-5.4003	122	72	130	14	31.99	1.2	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	93	19	1	2019
BRZ401	Pres. Kennedy	-48.5064	-8.5394	280	125	180	12	42.91	1.2	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	124	24	1	2019
BRZ402	Santa Maria	-47.7531	-8.7706	310	125	205	17	42.32	1.2	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	123	25	1	2019
BRZ403	Sao Bento	-47.9212	-6.0293	230	96	115	5	42.73	1.2	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	124	32	1	2019
BRZ404	Tancredo	-49.1548	-7.9687	185	48	105	14	27.70	1.2	ITL	L/FTC	2.9	0.6	PS	L/FHP	1.0	80	22	1	2019
BRZ405	Palmas	-48.3289	-10.3523	271	0	330	2	25.3	2.5	SBT	L/FTC	2.9	0.6	PS	L/FHP	1.0	73	17	1	2019
BRZ406	Araguaina	-48.2503	-7.2133	237	0	100	2	22.9	2.3	SBT	L/FTC	2.9	0.6	PS	L/FHP	1.0	66	18	1	2019