

# Phytosociological Research Center

www.globalbioclimatics.org

## Worldwide Bioclimatic Classification System

Prof.Dr. Salvador Rivas-Martinez

(Adapted to Synoptical Table 30/08/2017)

PARNAIBA (BRAZIL)

Altitude: 5 m.

Latitude: 2°54'S Longitude: 41°45'W

Temperature observation period.: 1983-1994 (12)

Rainfall observation period....: 1971-1994 (24)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPI
Jan.	29.45	35.00	23.89	37.78	20.00	73.4	167.07
Feb.	28.89	33.89	23.89	37.78	20.00	167.6	145.35
Mar.	28.06	32.78	23.33	37.22	17.78	255.0	153.91
Apr.	27.78	32.22	23.33	36.11	21.11	210.1	147.20
May.	27.78	32.78	22.78	37.78	20.00	105.4	150.12
Jun.	27.78	33.33	22.22	37.22	18.89	40.4	145.75
Jul.	27.78	33.89	21.67	37.22	18.89	11.9	150.12
Aug.	28.89	35.56	22.22	37.78	18.89	1.5	160.82
Sep.	29.45	36.11	22.78	40.00	18.89	1.8	159.11
Oct.	30.00	36.67	23.33	38.89	20.00	3.0	170.05
Nov.	30.00	36.67	23.33	37.78	17.22	2.0	166.78
Dec.	29.72	36.11	23.33	38.89	18.89	13.0	169.34
Year	28.80	34.58	23.01	37.87	19.21	885	1885.6

### BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	843
Compensated thermicity index.....(Itc):	843
Simple continentality index.....(Ic):	2.2
Diurnality index.....(Id):	13.3
Annual ombrothermic index.....(Io):	2.56
Monthly dry ombrothermic index.....(Iod1):	0.05
Bimonthly dry ombrothermic index.....(Iod2):	0.06
Three monthly dry ombrothermic index.....(Iod3):	0.07
Four monthly dry ombrothermic index.....(Iod4):	0.16
Annual ombro-evaporation index.....(Ioe):	0.12
Annual positive temperature.....(Tp):	3456
Annual negative temperature.....(Tn):	0
Dry station temperature.....(Td):	883
Positive precipitation.....(Pp):	885

N. of	P>4T	P:2T-4T	PT-2T	P<T	T<0
Months	3	2	1	6	0

Latitudinal Belt...: Equatorial

Continentalty.....: Hyperoceanic - Low Ultrahyperoceanic

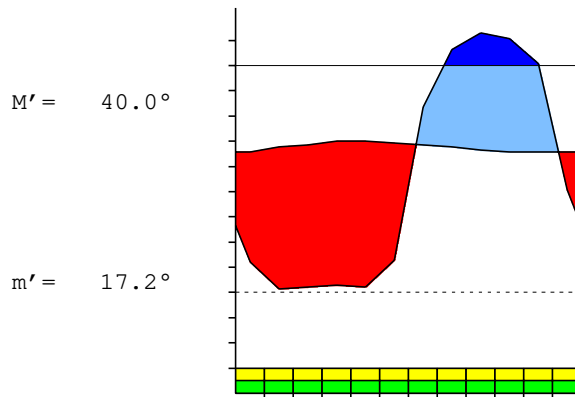
Bioclimate(Variant): TROPICAL XERIC (PLUVISEROTIN, DRY)

Bioclimatic Belt...: UPPER INFRATROPICAL LOW DRY

PARNAIBA (BRAZIL)

5 m

P= 885      2° 54' S      41° 45' W      12/24 y.  
 T= 28.8°    Ic= 2.2      Tp= 3456      Tn= 0  
 m= 23.3°    M= 32.2°      Itc= 843      Io= 2.6



TROPICAL XERIC (PLUVISEROTIN)  
 UPPER INFRATROPICAL LOW DRY

WATER INDEX CARD

PARNAIBA (BRAZIL)

Altitude: 5 m.

Latitude: 2° 54' S

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jul.	27.8	150	12	0	0	12	138	0	5	-0.9
Aug.	28.9	161	2	0	0	2	159	0	2	-0.9
Sep.	29.5	159	2	0	0	2	157	0	1	-0.9
Oct.	30.0	170	3	0	0	3	167	0	1	-0.9
Nov.	30.0	167	2	0	0	2	165	0	0	-0.9
Dec.	29.7	169	13	0	0	13	156	0	0	-0.9
Jan.	29.5	167	73	0	0	73	94	0	0	-0.5
Feb.	28.9	145	168	22	22	145	0	0	0	0.1
Mar.	28.1	154	255	78	100	154	0	23	12	0.6
Apr.	27.8	147	210	0	100	147	0	63	37	0.4
May.	27.8	150	105	-45	55	150	0	0	19	-0.2
Jun.	27.8	146	40	-55	0	96	50	0	9	-0.7
Year	28.8	1886	885	*	*	799	1087	86	86	*

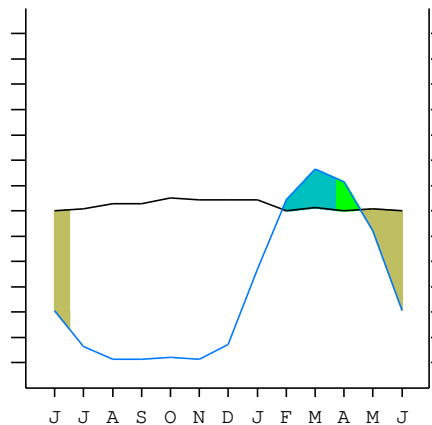
R = Reserve    VR = Variation of the reserve    RE = Real evapotranspiration  
 DR = Drainage    HC = Humidity coefficient    DF = Deficit    SP = Superavit

PARNAIBA (BRAZIL)

2°54' S    41°45' W      5 m 12/24 y.

T= 28.8    Ic= 2.2      TROPICAL XERIC (PLUVISEROTIN)  
 m= 23.3    Tp= 3456      UPPER INFRATROPICAL  
 M= 32.2    Tn= 0          LOW DRY  
 M' = 40.0    Itc= 843  
 m' = 17.2    Io= 2.6  
 P= 885      mm      ———  
 PE= 1886    mm      ———

Imbibing	25 Jan.
Saturation	24 Mar.
Reserve Use	18 Apr.
Deficit	16 Jun.



PARNAIBA (BRAZIL)

Latitude: 2°54'S Longitude: 41°45'W Altitude: 5 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [A1b]  
 + Type .....: A. Hyperoceanic  
 + Subtype .....: 1. Ultrahyperoceanic  
 + Variant .....: b. Low

Thermic types [A1.A1]  
 + Latitudinal zone ....: A. Warm  
 + Latitudinal belt ....: 1. Equatorial  
 + Thermic type .....: A. Warm  
 + Thermic subtype .....: 1. Torrid

Bioclimatic types [A3e.1a.5b]  
 + Macrobioclimate .....: A. TROPICAL  
 + Bioclimate .....: 3. XERIC  
 + Bioclimatic variant .: e. PLUVISEROTIN, DRY  
 + Thermic type.....: 1. INFRATROPICAL  
 + Thermic subtype.....: a. UPPER  
 + Ombrothermic type ...: 5. DRY  
 + Ombrothermic subtype : b. LOW  
 Bioclimatic Classification .....: Trxe (Pse).Itr.Dry

PARNAIBA (BRAZIL)

Latitude: 2°54'S Longitude: 41°45'W Altitude: 5 m

PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 95  
 Coldest semester of the year.....(Psw): 790  
 Warmest four months period of the year.....(Pcm1): 20  
 Following warmest four months period.....(Pcm2): 706  
 Positive precipitation dryest 3 months.....(Ppd): 6  
 Positive precipitation dryest 2 months.....(Ppd2): 3  
 Positive precipitation dryest 1 month.....(Ppd1): 2  
 Positive precipitation warmest 3 months.....(Pps): 18  
 Positive precipitation warmest 2 months.....(Pps2): 5  
 Positive precipitation warmest 1 month.....(Pps1): 3  
 Positive precipitation coldest 3 months.....(Ppw): 356  
 Positive precipitation coldest 2 months.....(Ppw2): 316  
 Positive precipitation coldest 1 month.....(Ppw1): 210

Seasons	Jun+Jul+Aug Ttr3-3	Sep+Oct+Nov Ttr4-4	Dec+Jan+Feb Ttr1-1	Mar+Apr+May Ttr2-2
Rainfall	53	6	254	570

Tropical rainfall rhythms: 2 > 1 > 3 > 4

PARNAIBA (BRAZIL)

Latitude: 2°54'S Longitude: 41°45'W Altitude: 5 m

TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 30.0  
 Average coldest month [T].....(Tmin): 27.8  
 Maximum temp. warmest month [M].....(Tmmax): 36.7  
 Minimum temp. coldest month [m].....(Tmmin): 21.7  
 Absolute Max.temp. warmest month [M'].....(Tamax): 40.0  
 Absolute Min.temp. coldest month [m'].....(Tamin): 17.2  
 First warmest contrasted month [M].....(Tcmax): 35.6 (8)  
 First coldest contrasted month [m].....(Tcmin): 22.2 (8)  
 Dry station temperature.....(Td): 883  
 Positive temperature dryest 3 months.....(Tpd): 883  
 Positive temperature dryest 2 months.....(Tpd2): 583  
 Positive temperature dryest 1 month.....(Tpd1): 289  
 Positive temperature warmest 3 months.....(Tps): 897  
 Positive temperature warmest 2 months.....(Tps2): 600  
 Positive temperature warmest 1 month.....(Tps1): 300  
 Positive temperature coldest 3 months.....(Tpw): 833  
 Positive temperature coldest 2 months.....(Tpw2): 556  
 Positive temperature coldest 1 month.....(Tpw1): 278

PARNAIBA (BRAZIL)

Latitude: 2°54'S Longitude: 41°45'W Altitude: 5 m

SEASONAL PARAMETERS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Warmest semester...(Sms)	o							o	o	o	o	o
Dryest semester....(Smd)							o	o	o	o	o	o
Warmest 4 months...(Cm1)									o	o	o	o
Dryest 4 months....(Cmd)								o	o	o	o	
Vegetation Activity(Pav)	o	o	o	o	o	o	o	o	o	o	o	o
Ultragelid...[M' <=0] (Pf)												
Hypergelid...[M <=0] (Pf)												
Gelid.....[T <=0] (Pf)												
Subgelid.....[m <=0] (Pf)												
Pregelid.....[m' <=0] (Pf)												
Agelid.....[m' > 0] (Pf)	o	o	o	o	o	o	o	o	o	o	o	o
HiperAgelid..[all>0] (Pf)	o	o	o	o	o	o	o	o	o	o	o	o

PARNAIBA (BRAZIL)

Latitude: 2°54'S Longitude: 41°45'W Altitude: 5 m

OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 2.13  
 Mediterranean index of January.....(Im1): No  
 Mediterranean index of January & February.....(Im2): No  
 Mediterranean index of December to February...(Im3): No

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	130	734	1676	2550	2101	1054	404	119	15	18	30	20
Tp	297	295	289	281	278	278	278	278	289	295	300	300
Io (Iom)	0.44	2.49	5.80	9.09	7.56	3.79	1.45	0.43	0.05	0.06	0.10	0.07
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp(x10)/Tp	2540 / 881			5705 / 836			538 / 845			68 / 895		
Io (Iot)	2.884			6.823			0.637			0.076		
Semesters	December-May						June-November					
Pp(x10)/Tp	8245 / 1717						606 / 1739					
Io (Iosm)	4.803						0.348					

PARNAIBA (BRAZIL)

Latitude: 2°54'S Longitude: 41°45'W Altitude: 5 m

Aridity Value Index (AVI)

[10xPP/TP=IO]: 8851/3456=2.56 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	130	734	1676	2550	2101	1054	404	119	15	18	30	20
Tp [T*10]	297	295	289	281	278	278	278	278	289	295	300	300
Iom [Pp/Tp]	44	249	580	909	756	379	145	43	5	6	10	7
Avm [200-Iom]	156	***	***	***	***	***	55	157	195	194	190	193
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp / Tp	2540 / 881			5705 / 836			538 / 845			68 / 895		
Iot [Pp/Tp]	288			682			64			8		
Avs E[Avm<200]	***			***			407			577		
Lower ultrahyperarid [5]						Strong lower arid [2]						
Weak lower arid [1]						Weak lower semiarid [1]						

PARNAIBA (BRAZIL)

Latitude: 2°54'S Longitude: 41°45'W Altitude: 5 m

BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....(Sp): 2.22  
 CI of Gorezinski (1920) [1.7\*Sp/sin(Lat)-20.4] .....: 54.20  
 CI of Conrad (1946) [1.7\*Sp/sin(Lat+10)-14] .....: 2.90  
 + Hyperoceanic (-20<CI<20)  
 CI of Currey (1974) [CI=Sp/(1+Lat/3)] .....: 1.13  
 + Subcontinental (1.1<CI<1.7)  
 Rainfall Index of Lang (1925) [R=P/T] .....: 30.73  
 + Steppic (40>R>0)  
 Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....: 22.81  
 + Subhumid (30>Ia>20)  
 I of Emberger (1930) [Q=100\*P/(Tmax<sup>2</sup>-Tmin<sup>2</sup>)] .....: 101.14  
 + Humid (Q>90)  
 I of Dantin & Revenga (1940) [DR=100\*T/P] .....: 3.25  
 + Arid (6>DR>3)  
 Aridity Index of UNEP [I=P/PE] .....: 0.47  
 + Semiarid (0.5>Im>0.2)  
 Potential Erosion I of Fournier (1960) [K=Pi<sup>2</sup>/P].....: 73.47  
 + Low (60<K<90)

PARNAIBA (BRAZIL)

Latitude: 2°54'S Longitude: 41°45'W Altitude: 5 m

BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)  
 + Climate .....: A. Warm and temperate warm  
 + Region .....: 3. Termoxeroteric (Mediterranean warm)  
 + Thermic type: 1. Megathermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.24	0.60	0.98	0.79	0.37	0.13	0.03	0.00	0.00	0.01	0.00	0.03
T-E ratio	13.25	13.00	12.63	12.50	12.50	12.50	12.50	13.00	13.25	13.50	13.50	13.37
Precipitation-effectiveness:	31.84					Temperature-efficiency .....: 155.51						
Moisture Index [MI=100*(P-PE)/PE] .....: -53.06 + D.Semiarid (-66.7<MI<-33.3)												
Index of dryness [DI=100*d/PE] .....: 57.63 + Strong deficit (33.3<DI)												
Index of humidity [HI=100*s/PE] .....: 4.57 + No surplus (0<HI<10)												
Potential Evapotranspiration PE .....: 1885.62 + Megathermic (PE>1440)												

