Phytosociological Research Center

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Worldwide Bioclimatic Classification System

Prof.Dr. Salvador Rivas-Martinez

(Adapted to Synoptical Table 30/08/2017)

IRAI (BRAZIL) Altitude: 247 m.

Latitude: 27°11'S Longitude: 53°14'W
Temperature observation period.: 1961-1990 (30)
Rainfall observation period....: 1961-1990 (30)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPi
Jan.	24.70	32.30	19.20	42.20	7.80	155.0	137.40
Feb.	24.60	31.90	19.50	39.40	7.00	159.0	117.77
Mar.	23.20	30.70	17.80	38.20	5.40	130.0	107.29
Apr.	19.40	27.10	14.00	35.30	1.00	145.0	67.55
May.	15.30	23.70	11.20	33.53	-1.80	162.0	39.89
Jun.	13.30	21.30	9.30	31.50	-2.80	149.0	27.86
Jul.	13.40	21.70	9.00	31.40	-3.20	122.0	29.92
Aug.	15.90	23.50	10.50	34.60	-3.40	148.0	45.08
Sep.	17.40	24.80	12.20	36.00	-1.60	160.0	56.08
Oct.	20.20	27.70	14.40	37.00	2.60	175.0	84.97
Nov.	22.10	29.60	16.50	39.00	7.00	162.0	103.42
Dec.	23.70	31.20	17.90	40.00	-2.10	144.0	127.12
Year	19.43	27.13	14.29	36.51	1.33	1811	944.35

BIOCLIMATIC INDICES AND DIAGNOSIS

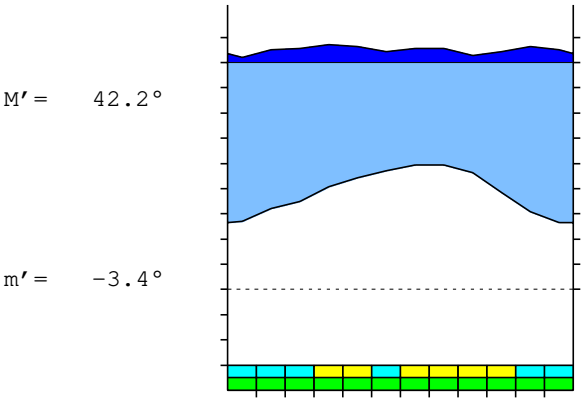
Thermicity index.....(It): 500
Compensated thermicity index.....(Itc): 500
Simple continentality index.....(Ic): 11.4
Diurnality index.....(Id): 13.3
Annual ombrothermic index.....(Io): 7.77
Monthly dry ombrothermic index.....(Iod1): 9.10
Bimonthly dry ombrothermic index.....(Iod2): 9.22
Threemonthly dry ombrothermic index.....(Iod3): 9.84
Fourmonthly dry ombrothermic index.....(Iod4): 10.03
Annual ombro-evaporation index.....(Ioe): 1.04
Annual positive temperature.....(Tp): 2332
Annual negative temperature.....(Tn): 0
Dry station temperature.....(Td): 426
Positive precipitation.....(Pp): 1811

N. of	P>4T	P:2T-4T	PT-2T	P<T	T<0
Months	12	0	0	0	0

Latitudinal Belt...: Subtropical
Continentality.....: Oceanic - High Semihyperoceanic
Bioclimate(Variant): TROPICAL PLUVIAL (HYGROPHYTIC)
Bioclimatic Belt...: UPPER THERMOTROPICAL LOW HUMID

IRAI (BRAZIL) 247 m

P= 1811 27° 11'S 53° 14'W 30/30 y.
T= 19.4° Ic= 11.4 Tp= 2332 Tn= 0
m= 9.3° M= 21.3° Itc= 500 Io= 7.8



TROPICAL PLUVIAL (HYGROPHYTIC)
UPPER THERMOTROPICAL LOW HUMID

WATER INDEX CARD IRAI (BRAZIL)
Altitude: 247 m. Latitude: 27° 11'S

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jul.	13.4	30	122	0	100	30	0	92	98	3.0
Aug.	15.9	45	148	0	100	45	0	103	101	2.2
Sep.	17.4	56	160	0	100	56	0	104	102	1.8
Oct.	20.2	85	175	0	100	85	0	90	96	1.0
Nov.	22.1	103	162	0	100	103	0	59	77	0.5
Dec.	23.7	127	144	0	100	127	0	17	47	0.1
Jan.	24.7	137	155	0	100	137	0	18	32	0.1
Feb.	24.6	118	159	0	100	118	0	41	37	0.3
Mar.	23.2	107	130	0	100	107	0	23	30	0.2
Apr.	19.4	68	145	0	100	68	0	77	54	1.1
May.	15.3	40	162	0	100	40	0	122	88	3.0
Jun.	13.3	28	149	0	100	28	0	121	104	4.3
Year	19.4	944	1811	*	*	944	0	867	867	*

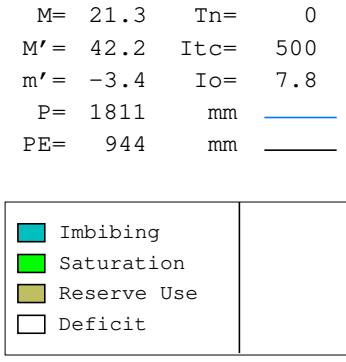
R = Reserve VR = Variation of the reserve RE = Real evapotranspiration
DR = Drainage HC = Humidity coeficient DF = Deficit SP = Superavit

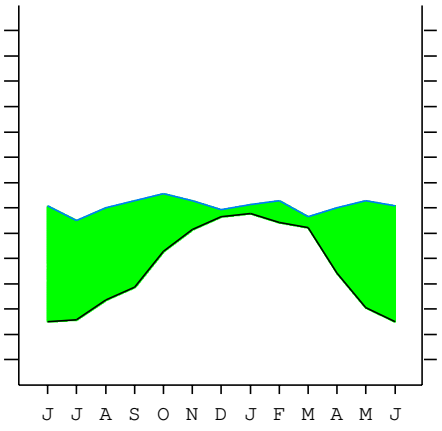
IRAI (BRAZIL)

27°11'S 53°14'W 247 m 30/30 y.

T= 19.4 Ic= 11.4
m= 9.3 Tp= 2332
M= 21.3 Tn= 0
M'= 42.2 Itc= 500
m'= -3.4 Io= 7.8
P= 1811 mm
PE= 944 mm

TROPICAL PLUVIAL (HYGROPHYTIC)
UPPER THERMOTROPICAL
LOW HUMID





All over the year,
there is no hydric deficit

IRAI (BRAZIL)

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SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continentality Index [B1a]
- + Type .....: B. Oceanic
- + Subtype .....: 1. Semihyperoceanic
- + Variant .....: a. High

Thermic types [A3.A2]
- + Latitudinal zone ....: A. Warm
- + Latitudinal belt ....: 3. Subtropical
- + Thermic type .....: A. Warm
- + Thermic subtype .....: 2. Warm

Bioclimatic types [A5.2a.7b]
- + Macrobioclimate .....: A. TROPICAL
- + Bioclimate .....: 5. PLUVIAL
- + Bioclimatic variant .:
- + Thermic type.....: 2. THERMOTROPICAL
- + Thermic subtype.....: a. UPPER
- + Ombrothermic type ...: 7. HUMID
- + Ombrothermic subtype : b. LOW

Bioclimatic Classification .....: Trhd.Ttr.Hum

IRAI (BRAZIL)

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 925
Coldest semester of the year.....(Psw): 886
Warmest four months period of the year.....(Pcm1): 588
Following warmest four months period.....(Pcm2): 578
Positive precipitation dryest 3 months.....(Ppd): 419
Positive precipitation dryest 2 months.....(Ppd2): 270
Positive precipitation dryest 1 month.....(Ppd1): 122
Positive precipitation warmest 3 months.....(Pps): 458
Positive precipitation warmest 2 months.....(Pps2): 314
Positive precipitation warmest 1 month.....(Pps1): 155
Positive precipitation coldest 3 months.....(Ppw): 433
Positive precipitation coldest 2 months.....(Ppw2): 271
Positive precipitation coldest 1 month.....(Ppw1): 149

Seasons	Winter Tr1-W	Spring Tr2-P	Summer Tr3-S	Automn Tr4-F
Rainfall	419	497	458	437

Seasonal rainfall rhythms: P > S > F > W

IRAI (BRAZIL)

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 24.7
Average coldest month [T].....(Tmin): 13.3
Maximum temp. warmest month [M].....(Tmmax): 32.3
Minimum temp. coldest month [m].....(Tmmin): 9.0
Absolute Max.temp. warmest month [M'].....(Tamax): 42.2
Absolute Min.temp. coldest month [m'].....(Tamin): -3.4
First warmest contrasted month [M].....(Tcmax): 27.7 (10)
First coldest contrasted month [m].....(Tcmin): 14.4 (10)
Dry station temperature.....(Td): 426
Positive temperature dryest 3 months.....(Tpd): 426
Positive temperature dryest 2 months.....(Tpd2): 293
Positive temperature dryest 1 month.....(Tpd1): 134
Positive temperature warmest 3 months.....(Tps): 730
Positive temperature warmest 2 months.....(Tps2): 493
Positive temperature warmest 1 month.....(Tps1): 247
Positive temperature coldest 3 months.....(Tpw): 420
Positive temperature coldest 2 months.....(Tpw2): 267
Positive temperature coldest 1 month.....(Tpw1): 133

IRAI (BRAZIL)

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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)					o	o	o	o	o			o
Agelid.....[m'> 0](Pf)	o	o	o	o						o	o	
HiperAgelid..[all>0](Pf)	o	o	o	o						o	o	

IRAI (BRAZIL)

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OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 0.52
Mediterranean index of January.....(Im1): 0.89
Mediterranean index of January & February.....(Im2): 0.81
Mediterranean index of December to February...(Im3): 0.83

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	1440	1550	1590	1300	1450	1620	1490	1220	1480	1600	1750	1620
Tp	237	247	246	232	194	153	133	134	159	174	202	221
Io (Iom)	6.08	6.28	6.46	5.60	7.47	10.6	11.2	9.10	9.31	9.20	8.66	7.33

Seasons	Summer	Automn	Winter	Spring
Pp(x10)/Tp	4580 / 730	4370 / 579	4190 / 426	4970 / 597
Io (Iot)	6.274	7.547	9.836	8.325

Semesters	December-May	June-November
Pp(x10)/Tp	8950 / 1309	9160 / 1023
Io (Iosm)	6.837	8.954

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 18110/2332=7.77 There is No Yearly Aridity

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	1440	1550	1590	1300	1450	1620	1490	1220	1480	1600	1750	1620
Tp [T*10]	237	247	246	232	194	153	133	134	159	174	202	221
Iom [Pp/Tp]	608	628	646	560	747	$$	$$	910	931	920	866	733
Avm [200-Iom]	***	***	***	***	***	***	***	***	***	***	***	***

Seasons	Summer	Automn	Winter	Spring
Pp / Tp	4580 / 730	4370 / 579	4190 / 426	4970 / 597
Iot [Pp/Tp]	627	755	984	832
Avs E[Avm<200]	***	***	***	***

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....(Sp): 11.40
CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4] .....: 22.02
CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14] .....: 18.07
  + 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] .....: 93.19
  + Temperate warm (100>R>60)
Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....: 61.53
  + Perhumid (Ia>60)
I of Emberger (1930) [Q=100*P/(Tmmax²-Tmmin²)] .....: 188.20
  + Humid (Q>90)
I of Dantin & Revenga (1940) [DR=100*T/P] .....: 1.07
  + Humid (2>DR>0)
Aridity Index of UNEP [I=P/PE] .....: 1.92
  + Humid (I>0.65)
Potencial Erosion I of Fournier (1960) [K=Pi²/P].....: 16.91
  + Very low (K<60)

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BIOCLIMATIC INDICES II

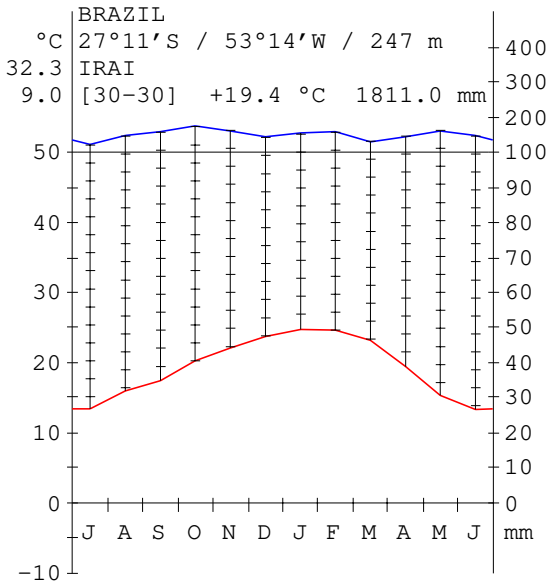
Bioclimatic classification of Gaussen & Bagnouls (1957)
  + Climate ....: A. Warm and temperate warm
  + Region .....: 7. Mesoaxeric (Axeric temperate)
  + Thermic type: 2. Macrothermic

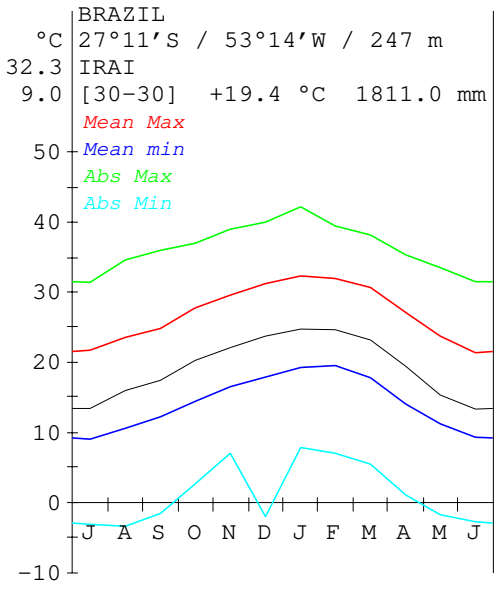
Thornthwaite (1948)

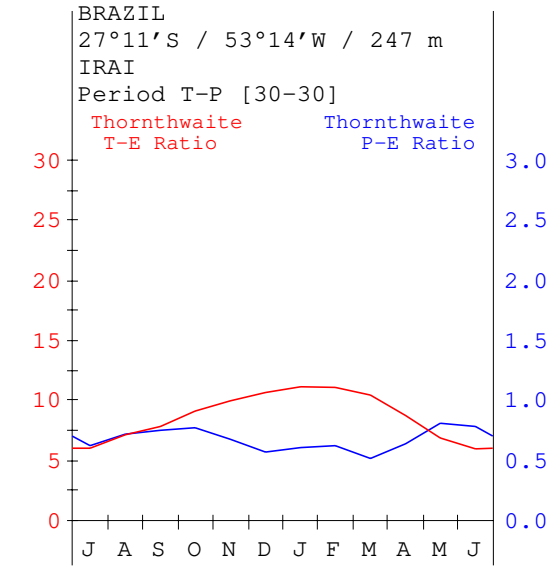
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.60	0.62	0.52	0.64	0.81	0.78	0.62	0.72	0.75	0.77	0.68	0.57
T-E ratio	11.12	11.07	10.44	8.73	6.89	5.99	6.03	7.15	7.83	9.09	9.95	10.67

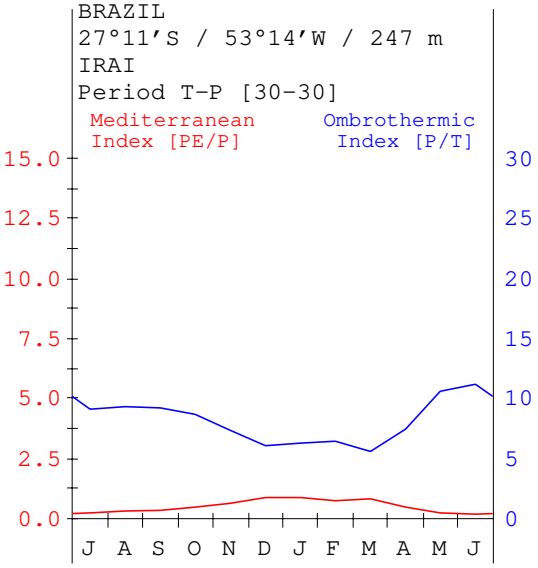
Precipitation-effectiveness: 80.86 Temperature-efficiency ....: 104.94

Moisture Index [MI=100*(P-PE)/PE] .....: 91.77
  + B4.Humid highest-humid (80<MI<100)
Index of dryness [DI=100*d/PE] .....: 0.00
  + No deficit (0<DI<16.7)
Index of humidity [HI=100*s/PE] .....: 91.77
  + Strong surplus (20<HI)
Potential Evapotranspiration PE .....: 944.35
  + Third mesothermic (855<PE<997)




BRAZIL
°C
27°11'S / 53°14'W / 247 m
32.3
IRAI
9.0
[30-30] +19.4 °C 1811.0 mm
Mean Max
Mean min
Abs Max
Abs Min
50
40
30
20
10
0
-10
J A S O N D J F M A M J


BRAZIL
27°11'S / 53°14'W / 247 m
IRAI
Period T-P [30-30]
Thornthwaite T-E Ratio
Thornthwaite P-E Ratio
30
25
20
15
10
5
0
3.0
2.5
2.0
1.5
1.0
0.5
0.0
J A S O N D J F M A M J


BRAZIL
27°11'S / 53°14'W / 247 m
IRAI
Period T-P [30-30]
Mediterranean Index [PE/P]
Ombrothermic Index [P/T]
15.0
12.5
10.0
7.5
5.0
2.5
0.0
30
25
20
15
10
5
0
J A S O N D J F M A M J