

# Phytosociological Research Center

www.globalbioclimatics.org

## Worldwide Bioclimatic Classification System

S.Rivas-Martinez(+) & S.Rivas-Saenz

(Adapted to Synoptical Table 14/02/2020)

PRES. R. SAENZ PENA (ARGENTINA) Altitude: 90 m.

Latitude: 26°49'S Longitude: 60°27'W

Temperature observation period.: 1987-1994 (8)

Rainfall observation period....: 1987-1994 (8)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPI
Jan.	27.50	35.00	20.00	43.89	10.00	135.6	169.34
Feb.	26.39	32.78	20.00	43.89	10.00	159.0	136.82
Mar.	24.17	30.00	18.33	38.89	7.22	240.3	112.91
Apr.	21.39	27.22	15.56	37.22	2.78	60.5	75.91
May.	19.72	25.00	14.44	33.89	-1.11	46.0	59.93
Jun.	16.39	22.22	10.56	32.22	-5.00	32.3	35.20
Jul.	16.39	22.22	10.56	32.78	-3.89	24.1	37.23
Aug.	18.61	25.56	11.67	40.00	-1.11	36.6	54.03
Sep.	19.73	26.67	12.78	38.89	0.00	49.5	64.53
Oct.	21.95	28.89	15.00	41.11	3.89	81.3	93.67
Nov.	23.89	31.11	16.67	41.11	7.22	128.8	116.96
Dec.	26.39	33.89	18.89	42.22	8.89	61.0	159.63
Year	21.88	28.38	15.37	38.84	3.24	1055	1116.1

### BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	547
Compensated thermicity index.....(Itc):	547
Simple continentality index.....(Ic):	11.1
Diurnality index.....(Id):	15.0
Annual ombrothermic index.....(Io):	4.02
Monthly dry ombrothermic index.....(Iod1):	1.47
Bimonthly dry ombrothermic index.....(Iod2):	1.72
Threemonthly dry ombrothermic index.....(Iod3):	1.81
Fourmonthly dry ombrothermic index.....(Iod4):	1.95
Annual ombro-evaporation index.....(Ioe):	0.95
Annual positive temperature.....(Tp):	2625
Annual negative temperature.....(Tn):	0
Dry station temperature.....(Td):	514
Positive precipitation.....(Pp):	1055

N. of Months	P>4T	P:2T-4T	PT-2T	P<T	T<0
	4	5	3	0	0

Latitudinal Belt...: Subtropical

Continentalite.....: Oceanic - High Semihyperoceanic

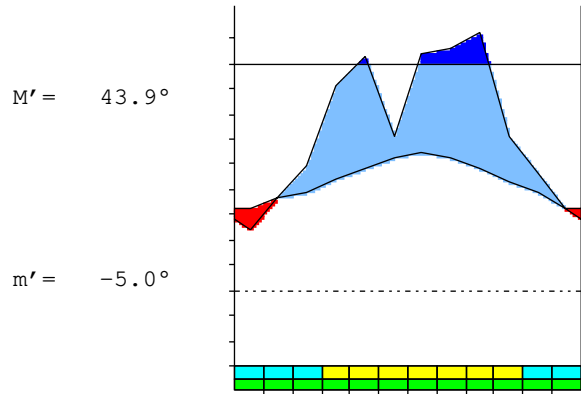
Bioclimate(Variant): TROPICAL PLUVISEASONAL (PLUVISEROTIN, MESOPHYTIC)

Bioclimatic Belt...: UPPER THERMOTROPICAL LOW SUBHUMID

PRES. R. SAENZ PENA (ARGENTINA)

90 m

P= 1055      26° 49'S      60° 27'W      8/8 y.  
 T= 21.9 °      Ic= 11.1      Tp= 2625      Tn= 0  
 m= 10.6 °      M= 22.2 °      Itc= 547      Io= 4.0



TROPICAL PLUVISEASONAL (PLUVISEROTIN)  
 UPPER THERMOTROPICAL LOW SUBHUMID

WATER INDEX CARD

PRES. R. SAENZ PENA (ARGENTINA)

Altitude: 90 m.

Latitude: 26° 49'S

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jul.	16.4	37	24	-13	55	37	0	0	2	-0.3
Aug.	18.6	54	37	-17	37	54	0	0	1	-0.3
Sep.	19.7	65	50	-15	22	65	0	0	0	-0.2
Oct.	22.0	94	81	-12	10	94	0	0	0	-0.1
Nov.	23.9	117	129	12	22	117	0	0	0	0.1
Dec.	26.4	160	61	-22	0	83	77	0	0	-0.6
Jan.	27.5	169	136	0	0	136	34	0	0	-0.1
Feb.	26.4	137	159	22	22	137	0	0	0	0.1
Mar.	24.2	113	240	78	100	113	0	50	25	1.1
Apr.	21.4	76	61	-15	85	76	0	0	12	-0.2
May.	19.7	60	46	-14	71	60	0	0	6	-0.2
Jun.	16.4	35	32	-3	68	35	0	0	3	0.0
Year	21.9	1116	1055	*	*	1005	111	50	50	*

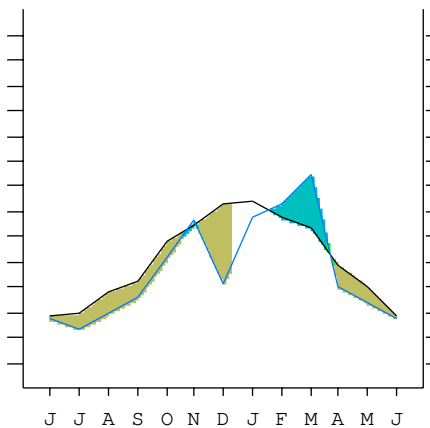
R = Reserve    VR = Variation of the reserve    RE = Real evapotranspiration  
 DR = Drainage    HC = Humidity coefficient    DF = Deficit    SP = Superavit

PRES. R. SAENZ PENA (ARGENTINA)

26°49'S    60°27'W    90 m    8/8 y.

T= 21.9      Ic= 11.1      TROPICAL PLUVISEASONAL (PLUVISEROTIN)  
 m= 10.6      Tp= 2625      UPPER THERMOTROPICAL  
 M= 22.2      Tn= 0      LOW SUBHUMID  
 M' = 43.9      Itc= 547  
 m' = -5.0      Io= 4.0  
 P= 1055      mm ———  
 PE= 1116      mm ———

Imbibing	19 Jan.
Saturation	19 Mar.
Reserve Use	27 Mar.
Deficit	7 Dec.



PRES. R. SAENZ PENA (ARGENTINA)

Latitude: 26°49'S Longitude: 60°27'W Altitude: 90 m

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 [A4e.2a.6b]  
 + Macrobioclimate .....: A. TROPICAL  
 + Bioclimate .....: 4. PLUVISEASONAL  
 + Bioclimatic variant .: PLUVISEROTIN, MESOPHYTIC  
 + Thermic type.....: 2. THERMOTROPICAL  
 + Thermic subtype.....: a. UPPER  
 + Ombrothermic type ...: 6. SUBHUMID  
 + Ombrothermic subtype : b. LOW

Bioclimatic Classification .....Trps(Pse).Ttr.Shu.Seo

PRES. R. SAENZ PENA (ARGENTINA)

Latitude: 26°49'S Longitude: 60°27'W Altitude: 90 m

PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 806  
 Coldest semester of the year.....(Psw): 249  
 Warmest four months period of the year.....(Pcm1): 596  
 Following warmest four months period.....(Pcm2): 163  
 Positive precipitation dryest 3 months.....(Ppd): 93  
 Positive precipitation dryest 2 months.....(Ppd2): 56  
 Positive precipitation dryest 1 month.....(Ppd1): 24  
 Positive precipitation warmest 3 months.....(Pps): 356  
 Positive precipitation warmest 2 months.....(Pps2): 295  
 Positive precipitation warmest 1 month.....(Pps1): 136  
 Positive precipitation coldest 3 months.....(Ppw): 93  
 Positive precipitation coldest 2 months.....(Ppw2): 56  
 Positive precipitation coldest 1 month.....(Ppw1): 32

Seasons	Winter Tr1-W	Spring Tr2-P	Summer Tr3-S	Automn Tr4-F
Rainfall	93	259	355	346

Seasonal rainfall rhythms: S > F > P > W

PRES. R. SAENZ PENA (ARGENTINA)

Latitude: 26°49'S Longitude: 60°27'W Altitude: 90 m

TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 27.5  
 Average coldest month [T].....(Tmin): 16.4  
 Maximum temp. warmest month [M].....(Tmmax): 35.0  
 Minimum temp. coldest month [m].....(Tmmin): 10.6  
 Absolute Max.temp. warmest month [M'].....(Tamax): 43.9  
 Absolute Min.temp. coldest month [m'].....(Tamin): -5.0  
 First warmest contrasted month [M].....(Tcmax): 35.0 (1)  
 First coldest contrasted month [m].....(Tcmin): 20.0 (1)  
 Dry station temperature.....(Td): 514  
 Positive temperature dryest 3 months.....(Tpd): 514  
 Positive temperature dryest 2 months.....(Tpd2): 328  
 Positive temperature dryest 1 month.....(Tpd1): 164  
 Positive temperature warmest 3 months.....(Tps): 803  
 Positive temperature warmest 2 months.....(Tps2): 539  
 Positive temperature warmest 1 month.....(Tps1): 275  
 Positive temperature coldest 3 months.....(Tpw): 514  
 Positive temperature coldest 2 months.....(Tpw2): 328  
 Positive temperature coldest 1 month.....(Tpw1): 164

PRES. R. SAENZ PENA (ARGENTINA)

Latitude: 26°49'S Longitude: 60°27'W Altitude: 90 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)					o	o	o	o	o			
Agelid.....[m'> 0] (Pf)	o	o	o	o						o	o	o
HiperAgelid..[all>0] (Pf)	o	o	o	o						o	o	o

PRES. R. SAENZ PENA (ARGENTINA)

Latitude: 26°49'S Longitude: 60°27'W Altitude: 90 m

OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 1.06  
 Mediterranean index of January.....(Im1): 1.25  
 Mediterranean index of January & February....(Im2): 1.04  
 Mediterranean index of December to February...(Im3): 1.31

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	610	1356	1590	2403	605	460	323	241	366	495	813	1288
Tp	264	275	264	242	214	197	164	164	186	197	220	239
Io (Iom)	2.31	4.93	6.03	9.94	2.83	2.33	1.97	1.47	1.97	2.51	3.70	5.39
Seasons	Summer			Autumn			Winter			Spring		
Pp(x10)/Tp	3556 / 803			3468 / 653			930 / 514			2596 / 656		
Io (Iot)	4.429			5.313			1.810			3.959		
Semesters	December-May						June-November					
Pp(x10)/Tp	7024 / 1456						3526 / 1170					
Io (Iosm)	4.826						3.015					

PRES. R. SAENZ PENA (ARGENTINA)

Latitude: 26°49'S Longitude: 60°27'W Altitude: 90 m

Aridity Value Index (AVI)

[10xPP/TP=IO]: 10550/2625=4.02 There is No Yearly Aridity

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	610	1356	1590	2403	605	460	323	241	366	495	813	1288
Tp [T*10]	264	275	264	242	214	197	164	164	186	197	220	239
Iom [Pp/Tp]	231	493	603	994	283	233	197	147	197	251	370	539
Avm [200-Iom]	***	***	***	***	***	***	3	53	3	***	***	***
Seasons	Summer			Autumn			Winter			Spring		
Pp / Tp	3556 / 803			3468 / 653			930 / 514			2596 / 656		
Iot [Pp/Tp]	443			531			181			396		
Avs E[Avm<200]	***			***			59			***		
Weak lower semiarid [1]							Weak upper semiarid [3]					

PRES. R. SAENZ PENA (ARGENTINA)

Latitude: 26°49'S Longitude: 60°27'W Altitude: 90 m

BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....(Sp): 11.11  
 CI of Gorezinski (1920) [1.7\*Sp/sin(Lat)-20.4] .....: 21.47  
 CI of Conrad (1946) [1.7\*Sp/sin(Lat+10)-14] .....: 17.52  
 + Hyperoceanic (-20<CI<20)  
 CI of Currey (1974) [CI=Sp/(1+Lat/3)] .....: 1.12  
 + Subcontinental (1.1<CI<1.7)  
 Rainfall Index of Lang (1925) [R=P/T] .....: 48.22  
 + Semiarid (60>R>40)  
 Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....: 33.10  
 + Humid (60>Ia>30)  
 I of Emberger (1930) [Q=100\*P/(Tmmax<sup>2</sup>-Tmmin<sup>2</sup>)] .....: 94.75  
 + Humid (Q>90)  
 I of Dantin & Revenga (1940) [DR=100\*T/P] .....: 2.07  
 + Semiarid (3>DR>2)  
 Aridity Index of UNEP [I=P/PE] .....: 0.95  
 + Humid (I>0.65)  
 Potencial Erosion I of Fournier (1960) [K=Pi<sup>2</sup>/P].....: 54.73  
 + Very low (K<60)

PRES. R. SAENZ PENA (ARGENTINA)

Latitude: 26°49'S Longitude: 60°27'W Altitude: 90 m

BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)  
 + Climate .....: A. Warm and temperate warm  
 + Region .....: 3. Termoxeroteric (Mediterranean warm)  
 + Thermic type: 2. Macrothermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.49	0.60	1.00	0.23	0.18	0.13	0.09	0.14	0.19	0.32	0.50	0.21
T-E ratio	12.38	11.88	10.88	9.63	8.87	7.38	7.38	8.37	8.88	9.88	10.75	11.88
Precipitation-effectiveness: 40.73						Temperature-efficiency .....: 118.13						
Moisture Index [MI=100*(P-PE)/PE] .....: -5.48 + C1.Subhumid dry (-33.3<MI<0)												
Index of dryness [DI=100*d/PE] .....: 9.92 + No deficit (0<DI<16.7)												
Index of humidity [HI=100*s/PE] .....: 4.43 + No surplus (0<HI<10)												
Potential Evapotranspiration PE .....: 1116.15 + Forth mesothermic (997<PE<1440)												

