

# Phytosociological Research Center

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## Worldwide Bioclimatic Classification System

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(Adapted to Synoptical Table 30/08/2017)

MAR DEL PLATA (ARGENTINA)

Altitude: 14 m.

Latitude: 38°8'S Longitude: 57°33'W

Temperature observation period.: 1950-1980 (31)

Rainfall observation period....: 1950-1980 (31)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPI
Jan.	19.00	0.00	0.00	38.80	3.20	70.0	107.33
Feb.	19.30	0.00	0.00	40.20	4.00	73.0	92.98
Mar.	17.80	0.00	0.00	36.80	2.00	89.0	84.06
Apr.	14.90	0.00	0.00	31.80	-2.00	65.0	57.33
May.	11.30	0.00	0.00	31.50	-3.00	66.0	36.79
Jun.	8.90	0.00	0.00	23.30	-5.50	62.0	24.43
Jul.	7.70	0.00	0.00	24.00	-6.60	51.0	21.31
Aug.	8.40	0.00	0.00	23.70	-4.00	48.0	26.25
Sep.	9.70	0.00	0.00	32.10	-4.00	55.0	34.34
Oct.	11.80	0.00	0.00	31.20	-2.70	57.0	51.14
Nov.	14.90	0.00	0.00	34.00	-0.60	68.0	73.36
Dec.	17.20	0.00	0.00	37.90	0.20	64.0	95.96
Year	13.41	0.00	0.00	32.11	-1.58	768	705.28

### BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	288
Compensated thermicity index.....(Itc):	288
Simple continentality index.....(Ic):	11.6
Diurnality index.....(Id):	0.0
Annual ombrothermic index.....(Io):	4.77
Monthly estival ombrothermic index.....(Ios1):	3.68
Bimonthly estival ombrothermic index.....(Ios2):	3.73
Three monthly estival ombrothermic index.....(Ios3):	3.73
Four monthly estival ombrothermic index.....(Ios4):	3.91
Annual ombro-evaporation index.....(Ioe):	1.27
Annual positive temperature.....(Tp):	1609
Annual negative temperature.....(Tn):	0
Estival temperature.....(Ts):	555
Positive precipitation.....(Pp):	768

N. of	P>4T	P:2T-4T	PT-2T	P<T	T<0
Months	9	3	0	0	0

Latitudinal Belt...: Low eutemperate

Continentalty.....: Oceanic - High Semihyperoceanic

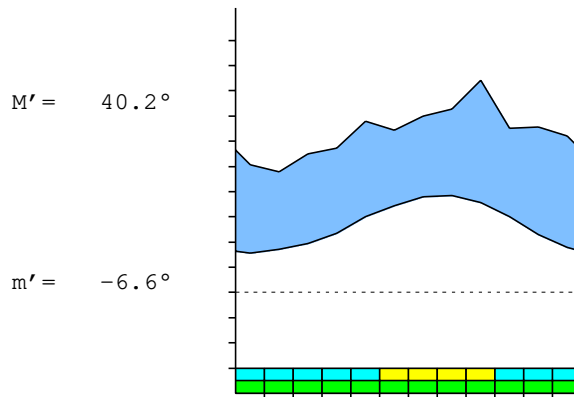
Bioclimate.....: TEMPERATE OCEANIC

Bioclimatic Belt...: LOW MESOTEMPERATE LOW SUBHUMID

MAR DEL PLATA (ARGENTINA)

14 m

P= 768 38° 8'S 57° 33'W 31/31 y.  
 T= 13.4° Ic= 11.6 Tp= 1609 Tn= 0  
 m= 7.7° M= 7.7° Itc= 288 Io= 4.8



TEMPERATE OCEANIC  
 LOW MESOTEMPERATE LOW SUBHUMID

WATER INDEX CARD MAR DEL PLATA (ARGENTINA)  
 Altitude: 14 m. Latitude: 38° 8'S

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jul.	7.7	21	51	15	100	21	0	14	7	1.3
Aug.	8.4	26	48	0	100	26	0	22	14	0.8
Sep.	9.7	34	55	0	100	34	0	21	18	0.6
Oct.	11.8	51	57	0	100	51	0	6	12	0.1
Nov.	14.9	73	68	-5	95	73	0	0	6	0.0
Dec.	17.2	96	64	-32	63	96	0	0	3	-0.3
Jan.	19.0	107	70	-37	25	107	0	0	1	-0.3
Feb.	19.3	93	73	-20	5	93	0	0	1	-0.2
Mar.	17.8	84	89	5	10	84	0	0	0	0.0
Apr.	14.9	57	65	8	18	57	0	0	0	0.1
May.	11.3	37	66	29	47	37	0	0	0	0.7
Jun.	8.9	24	62	38	85	24	0	0	0	1.5
Year	13.4	705	768	*	*	705	0	63	63	*

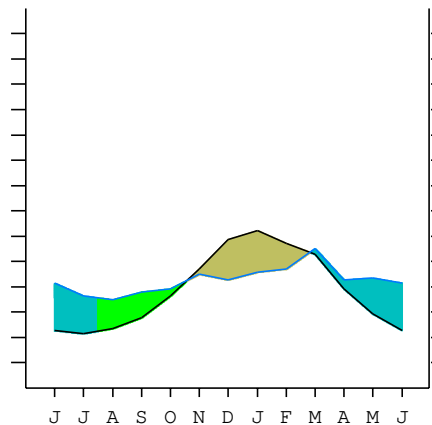
R = Reserve VR = Variation of the reserve RE = Real evapotranspiration  
 DR = Drainage HC = Humidity coefficient DF = Deficit SP = Superavit

MAR DEL PLATA (ARGENTINA)

38°8'S 57°33'W 14 m 31/31 y.

T= 13.4 Ic= 11.6 TEMPERATE OCEANIC  
 m= 7.7 Tp= 1609 LOW MESOTEMPERATE  
 M= 7.7 Tn= 0 LOW SUBHUMID  
 M' = 40.2 Itc= 288  
 m' = -6.6 Io= 4.8  
 P= 768 mm  
 PE= 705 mm

Imbibing	25 Feb.
Saturation	16 Jul.
Reserve Use	16 Oct.
Deficit	



MAR DEL PLATA (ARGENTINA)

Latitude: 38°8'S Longitude: 57°33'W Altitude: 14 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [B1a]  
 + Type .....: B. Oceanic  
 + Subtype .....: 1. Semihyperoceanic  
 + Variant .....: a. High  
 Thermic types [B1.B4]  
 + Latitudinal zone .....: B. Temperate  
 + Latitudinal belt .....: 1. Low eutemperate  
 + Thermic type .....: B. Temperate  
 + Thermic subtype .....: 4. Temperate  
 Bioclimatic types [C3.3b.6b]  
 + Macrobioclimate .....: C. TEMPERATE  
 + Bioclimate .....: 3. OCEANIC  
 + Bioclimatic variant ..:  
 + Thermic type.....: 3. MESOTEMPERATE  
 + Thermic subtype.....: b. LOW  
 + Ombrothermic type ...: 6. SUBHUMID  
 + Ombrothermic subtype : b. LOW  
 Bioclimatic Classification .....: Teco.Mte.Shu

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 429  
 Coldest semester of the year.....(Psw): 339  
 Warmest four months period of the year.....(Pcm1): 296  
 Following warmest four months period.....(Pcm2): 244  
 Positive precipitation dryest 3 months.....(Ppd): 154  
 Positive precipitation dryest 2 months.....(Ppd2): 99  
 Positive precipitation dryest 1 month.....(Ppd1): 48  
 Positive precipitation warmest 3 months.....(Pps): 232  
 Positive precipitation warmest 2 months.....(Pps2): 143  
 Positive precipitation warmest 1 month.....(Pps1): 73  
 Positive precipitation coldest 3 months.....(Ppw): 161  
 Positive precipitation coldest 2 months.....(Ppw2): 99  
 Positive precipitation coldest 1 month.....(Ppw1): 51

Seasons	Winter Tr1-W	Spring Tr2-P	Summer Tr3-S	Automn Tr4-F
Rainfall	161	180	207	220

Seasonal rainfall rhythms: F > S > P > W

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 19.3  
 Average coldest month [T].....(Tmin): 7.7  
 Maximum temp. warmest month [M].....(Tmmax): 0.0  
 Minimum temp. coldest month [m].....(Tmmin): 0.0  
 Absolute Max.temp. warmest month [M'].....(Tamax): 40.2  
 Absolute Min.temp. coldest month [m'].....(Tamin): -6.6  
 First warmest contrasted month [M].....(Tcmax): 0.0 (0)  
 First coldest contrasted month [m].....(Tcmin): 0.0 (0)  
 Estival temperature.....(Ts): 555  
 Positive temperature dryest 3 months.....(Tpd): 258  
 Positive temperature dryest 2 months.....(Tpd2): 161  
 Positive temperature dryest 1 month.....(Tpd1): 84  
 Positive temperature warmest 3 months.....(Tps): 561  
 Positive temperature warmest 2 months.....(Tps2): 383  
 Positive temperature warmest 1 month.....(Tps1): 193  
 Positive temperature coldest 3 months.....(Tpw): 250  
 Positive temperature coldest 2 months.....(Tpw2): 161  
 Positive temperature coldest 1 month.....(Tpw1): 77

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

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OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 0.92  
 Mediterranean index of January.....(Im1): 1.53  
 Mediterranean index of January & February.....(Im2): 1.40  
 Mediterranean index of December to February...(Im3): 1.43

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	640	700	730	890	650	660	620	510	480	550	570	680
Tp	172	190	193	178	149	113	89	77	84	97	118	149
Io (Iom)	3.72	3.68	3.78	5.00	4.36	5.84	6.97	6.62	5.71	5.67	4.83	4.56
Seasons	Summer			Autumn			Winter			Spring		
Pp(x10)/Tp	2070 / 555			2200 / 440			1610 / 250			1800 / 364		
Io (Iot)	3.730			5.000			6.440			4.945		
Semesters	December-May						June-November					
Pp(x10)/Tp	4270 / 995						3410 / 614					
Io (Iosm)	4.291						5.554					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 7680/1609=4.77 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	640	700	730	890	650	660	620	510	480	550	570	680
Tp [T*10]	172	190	193	178	149	113	89	77	84	97	118	149
Iom [Pp/Tp]	372	368	378	500	436	584	697	662	571	567	483	456
Avm [200-Iom]	***	***	***	***	***	***	***	***	***	***	***	***
Seasons	Summer			Autumn			Winter			Spring		
Pp / Tp	2070 / 555			2200 / 440			1610 / 250			1800 / 364		
Iot [Pp/Tp]	373			500			644			495		
Avs E[Avm<200]	***			***			***			***		

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....	(Sp):	11.60
CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4] .....		11.54
CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14] .....		12.48
+ Hyperoceanic (-20<CI<20)		
CI of Currey (1974) [CI=Sp/(1+Lat/3)] .....		0.85
+ Oceanic (0.6<CI<1.1)		
Rainfall Index of Lang (1925) [R=P/T] .....		57.28
+ Semiarid (60>R>40)		
Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....		32.81
+ Humid (60>Ia>30)		
I of Emberger (1930) [Q=100*P/(Tmax <sup>2</sup> -Tmin <sup>2</sup> )] .....		0.00
+ Arid (30>Q>0)		
I of Dantin & Revenga (1940) [DR=100*T/P] .....		1.75
+ Humid (2>DR>0)		
Aridity Index of UNEP [I=P/PE] .....		1.09
+ Humid (I>0.65)		
Potential Erosion I of Fournier (1960) [K=Pi <sup>2</sup> /P] .....		10.31
+ Very low (K<60)		

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BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)  
 + Climate .....

- + Climate .....
- + Region .....
- + Thermic type: 4. Mesothermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.29	0.30	0.39	0.30	0.34	0.34	0.29	0.26	0.29	0.28	0.31	0.27
T-E ratio	8.55	8.68	8.01	6.70	5.09	4.00	3.46	3.78	4.36	5.31	6.70	7.74
Precipitation-effectiveness: 36.51						Temperature-efficiency .....						72.40
Moisture Index [MI=100*(P-PE)/PE] .....												8.89
+ C2.Subhumid humid (0<MI<20)												
Index of dryness [DI=100*d/PE] .....												0.00
+ No deficit (0<DI<16.7)												
Index of humidity [HI=100*s/PE] .....												8.89
+ No surplus (0<HI<10)												
Potential Evapotranspiration PE .....												705.28
+ First mesothermic (570<PE<712)												

