

Phytosociological Research Center

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Worldwide Bioclimatic Classification System

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(Adapted to Synoptical Table 30/08/2017)

CARTAGENA (ESP MURCIA)

Altitude: 14 m.

Latitude: 37°36'N Longitude: 0°59'W

Temperature observation period.: 1919-1936 (18)

Rainfall observation period....: 1919-1936 (18)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPI
Jan.	10.60	15.90	5.40	18.20	1.00	16.0	21.83
Feb.	11.30	16.40	6.20	20.60	1.50	33.0	24.22
Mar.	13.10	18.30	7.80	22.60	3.30	28.0	38.80
Apr.	15.20	20.60	9.80	24.50	5.30	22.0	54.21
May.	18.10	23.30	12.90	26.60	8.90	21.0	83.11
Jun.	21.70	27.20	16.20	31.60	12.80	12.0	116.30
Jul.	24.70	30.20	19.20	33.90	16.50	0.0	148.16
Aug.	25.60	31.00	20.20	34.50	17.00	4.0	147.94
Sep.	23.20	28.50	18.00	32.00	14.40	41.0	110.07
Oct.	18.70	23.10	14.20	28.10	9.60	31.0	68.81
Nov.	14.30	19.30	9.40	23.70	4.50	51.0	37.07
Dec.	11.50	16.80	6.10	21.20	1.40	28.0	24.70
Year	17.33	22.55	12.12	26.46	8.02	287	875.22

BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	386
Compensated thermicity index.....(Itc):	386
Simple continentality index.....(Ic):	15.0
Diurnality index.....(Id):	11.0
Annual ombrothermic index.....(Io):	1.38
Monthly estival ombrothermic index.....(Ios1):	No
Bimonthly estival ombrothermic index.....(Ios2):	0.08
Three monthly estival ombrothermic index.....(Ios3):	0.22
Four monthly estival ombrothermic index.....(Ios4):	0.41
Annual ombro-evaporation index.....(Ioe):	0.61
Annual positive temperature.....(Tp):	2080
Annual negative temperature.....(Tn):	0
Estival temperature.....(Ts):	720
Positive precipitation.....(Pp):	287

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

Latitudinal Belt...: Low eutemperate

Continentalty.....: Oceanic - High Euoceanic

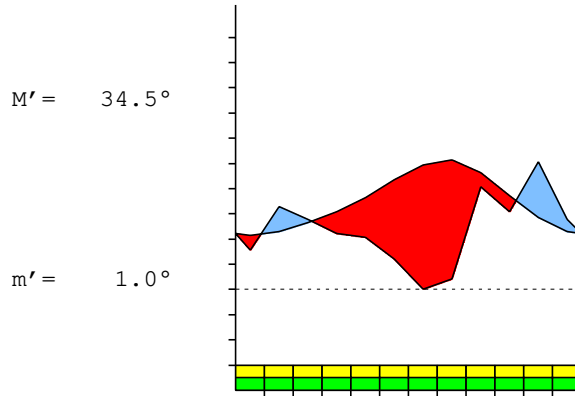
Bioclimate.....: MEDITERRANEAN XERIC-OCEANIC

Bioclimatic Belt...: UPPER THERMOMEDITERRANEAN LOW SEMIARID

CARTAGENA (ESP MURCIA)

14 m

P= 287 37° 36'N 0° 59'W 18/18 y.
 T= 17.3° Ic= 15.0 Tp= 2080 Tn= 0
 m= 5.4° M= 15.9° Itc= 386 Io= 1.4



MEDITERRANEAN XERIC-OCEANIC
 UPPER THERMOMEDITERRANEAN LOW SEMIARID

WATER INDEX CARD CARTAGENA (ESP MURCIA)
 Altitude: 14 m. Latitude: 37° 36'N

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jan.	10.6	22	16	-6	11	22	0	0	0	-0.2
Feb.	11.3	24	33	9	20	24	0	0	0	0.3
Mar.	13.1	39	28	-11	9	39	0	0	0	-0.2
Apr.	15.2	54	22	-9	0	31	23	0	0	-0.5
May.	18.1	83	21	0	0	21	62	0	0	-0.7
Jun.	21.7	116	12	0	0	12	104	0	0	-0.8
Jul.	24.7	148	0	0	0	0	148	0	0	-1.0
Aug.	25.6	148	4	0	0	4	144	0	0	-0.9
Sep.	23.2	110	41	0	0	41	69	0	0	-0.6
Oct.	18.7	69	31	0	0	31	38	0	0	-0.5
Nov.	14.3	37	51	14	14	37	0	0	0	0.3
Dec.	11.5	25	28	3	17	25	0	0	0	0.1
Year	17.3	875	287	*	*	287	588	0	0	*

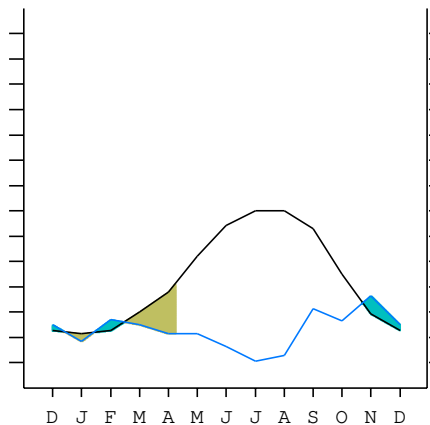
R = Reserve VR = Variation of the reserve RE = Real evapotranspiration
 DR = Drainage HC = Humidity coefficient DF = Deficit SP = Superavit

CARTAGENA (ESP MURCIA)

37°36'N 0°59'W 14 m 18/18 y.

T= 17.3 Ic= 15.0 MEDITERRANEAN XERIC-OCEANIC
 m= 5.4 Tp= 2080 UPPER THERMOMEDITERRANEAN
 M= 15.9 Tn= 0 LOW SEMIARID
 M' = 34.5 Itc= 386
 m' = 1.0 Io= 1.4
 P= 287 mm
 PE= 875 mm

Imbibing	22 Oct.
Saturation	14 Feb.
Reserve Use	9 Apr.
Deficit	



CARTAGENA (ESP MURCIA)

Latitude: 37°36'N Longitude: 0°59'W Altitude: 14 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [B2a]
 + Type: B. Oceanic
 + Subtype: 2. Euoceanic
 + Variant: a. High

Thermic types [B1.A3]
 + Latitudinal zone: B. Temperate
 + Latitudinal belt: 1. Low eutemperate
 + Thermic type: A. Warm
 + Thermic subtype: 3. Subwarm

Bioclimatic types [B6.2a.4b]
 + Macrobioclimate: B. MEDITERRANEAN
 + Bioclimate: 6. XERIC-OCEANIC
 + Bioclimatic variant ..:
 + Thermic type.....: 2. THERMOMEDITERRANEAN
 + Thermic subtype.....: a. UPPER
 + Ombrothermic type ...: 4. SEMIARID
 + Ombrothermic subtype : b. LOW

Bioclimatic Classification: MepDC.Tme.Sar

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 109
 Coldest semester of the year.....(Psw): 178
 Warmest four months period of the year.....(Pcm1): 57
 Following warmest four months period.....(Pcm2): 126
 Positive precipitation dryest 3 months.....(Ppd): 16
 Positive precipitation dryest 2 months.....(Ppd2): 4
 Positive precipitation dryest 1 month.....(Ppd1): 0
 Positive precipitation warmest 3 months.....(Pps): 45
 Positive precipitation warmest 2 months.....(Pps2): 4
 Positive precipitation warmest 1 month.....(Pps1): 4
 Positive precipitation coldest 3 months.....(Ppw): 77
 Positive precipitation coldest 2 months.....(Ppw2): 49
 Positive precipitation coldest 1 month.....(Ppw1): 16

Seasons	Winter Tr1-W	Spring Tr2-P	Summer Tr3-S	Automn Tr4-F
Rainfall	77	71	16	123

Seasonal rainfall rhythms: F > W > P > S

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 25.6
 Average coldest month [T].....(Tmin): 10.6
 Maximum temp. warmest month [M].....(Tmmax): 31.0
 Minimum temp. coldest month [m].....(Tmmin): 5.4
 Absolute Max.temp. warmest month [M'].....(Tamax): 34.5
 Absolute Min.temp. coldest month [m'].....(Tamin): 1.0
 First warmest contrasted month [M].....(Tcmax): 27.2 (6)
 First coldest contrasted month [m].....(Tcmin): 16.2 (6)
 Estival temperature.....(Ts): 720
 Positive temperature dryest 3 months.....(Tpd): 720
 Positive temperature dryest 2 months.....(Tpd2): 503
 Positive temperature dryest 1 month.....(Tpd1): 247
 Positive temperature warmest 3 months.....(Tps): 735
 Positive temperature warmest 2 months.....(Tps2): 503
 Positive temperature warmest 1 month.....(Tps1): 256
 Positive temperature coldest 3 months.....(Tpw): 334
 Positive temperature coldest 2 months.....(Tpw2): 219
 Positive temperature coldest 1 month.....(Tpw1): 106

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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)												
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

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OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 3.05
 Mediterranean index of July.[PE/P].....(Im1): No
 Mediterranean index of July & August.....(Im2): 74.02
 Mediterranean index of June, July & August....(Im3): 25.77

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	280	160	330	280	220	210	120	0	40	410	310	510
Tp	115	106	113	131	152	181	217	247	256	232	187	143
Io (Iom)	2.43	1.51	2.92	2.14	1.45	1.16	0.55	0.00	0.16	1.77	1.66	3.57
Seasons	Winter			Spring			Summer			Autumn		
Pp(x10)/Tp	770 / 334			710 / 464			160 / 720			1230 / 562		
Io (Iot)	2.305			1.530			0.222			2.189		
Semesters	December-May						June-November					
Pp(x10)/Tp	1480 / 798						1390 / 1282					
Io (Iosm)	1.855						1.084					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 2870/2080=1.38 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	280	160	330	280	220	210	120	0	40	410	310	510
Tp [T*10]	115	106	113	131	152	181	217	247	256	232	187	143
Iom [Pp/Tp]	243	151	292	214	145	116	55	0	16	177	166	357
Avm [200-Iom]	***	49	***	***	55	84	145	200	184	23	34	***
Seasons	Winter			Spring			Summer			Autumn		
Pp / Tp	770 / 334			710 / 464			160 / 720			1230 / 562		
Iot [Pp/Tp]	231			153			22			219		
Avs E[Avm<200]	***			***			529			***		
Lower ultrahyperarid [1]							Upper ultrahyperarid [1]					
Lower hyperarid [1]							Weak lower arid [1]					
Strong lower semiarid [1]							Weak lower semiarid [1]					
Strong upper semiarid [2]							Weak upper semiarid [1]					

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin]	(Sp): 15.00
CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4]	21.39
CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14]	20.53
+ Oceanic (20<CI<40)	
CI of Currey (1974) [CI=Sp/(1+Lat/3)]	1.11
+ Subcontinental (1.1<CI<1.7)	
Rainfall Index of Lang (1925) [R=P/T]	16.56
+ Steppic (40>R>0)	
Aridity Index of Martonne (1926) [Ia=P/(T+10)]	10.50
+ Arid -steppic- (15>Ia>5)	
I of Emberger (1930) [Q=100*P/(Tmax ² -Tmin ²)]	30.80
+ Semiarid (50>Q>30)	
I of Dantin & Revenga (1940) [DR=100*T/P]	6.04
+ Extremely arid (DR>6)	
Aridity Index of UNEP [I=P/PE]	0.33
+ Semiarid (0.5>Im>0.2)	
Potential Erosion I of Fournier (1960) [K=Pi ² /P]	9.06
+ Very low (K<60)	

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BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)
 + Climate

- + Climate
- + Region
- + Thermic type: 3. Macro-mesothermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.07	0.16	0.12	0.09	0.08	0.04	0.00	0.01	0.14	0.12	0.23	0.13
T-E ratio	4.77	5.09	5.90	6.84	8.15	9.77	11.12	11.52	10.44	8.42	6.44	5.18
Precipitation-effectiveness: 11.83						Temperature-efficiency						93.60
Moisture Index [MI=100*(P-PE)/PE]												
+ E.Dry (-110<MI<-66.7)												
Index of dryness [DI=100*d/PE]												
+ Strong deficit (33.3<DI)												
Index of humidity [HI=100*s/PE]												
+ No surplus (0<HI<10)												
Potential Evapotranspiration PE												
+ Third mesothermic (855<PE<997)												

