

# Phytosociological Research Center

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## Worldwide Bioclimatic Classification System

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(Adapted to Synoptical Table 30/08/2017)

MAUN (BOTSWANA)

Altitude: 945 m.

Latitude: 19°59'S Longitude: 23°25'E

Temperature observation period.: 1969-1994 (26)

Rainfall observation period....: 1974-1994 (21)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPI
Jan.	25.56	32.22	18.89	40.00	8.89	109.2	140.80
Feb.	25.28	31.67	18.89	39.44	8.89	96.5	120.03
Mar.	24.17	31.11	17.22	38.89	10.00	88.9	112.15
Apr.	22.50	30.56	14.44	37.22	3.33	27.9	86.03
May.	18.61	27.78	9.44	35.56	-1.67	5.1	52.00
Jun.	15.28	25.00	5.56	33.33	-3.89	1.3	29.54
Jul.	15.28	25.00	5.56	32.22	-3.89	0.0	30.84
Aug.	18.33	28.33	8.33	36.11	-4.44	0.0	52.08
Sep.	22.78	32.78	12.78	38.33	-0.56	1.3	91.58
Oct.	26.39	35.00	17.78	42.78	6.11	12.7	146.27
Nov.	26.67	34.44	18.89	43.33	9.44	48.3	149.18
Dec.	25.84	32.78	18.89	42.22	11.11	71.1	146.11
Year	22.22	30.56	13.89	38.29	3.61	462	1156.6

### BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	528
Compensated thermicity index.....(Itc):	528
Simple continentality index.....(Ic):	11.4
Diurnality index.....(Id):	20.0
Annual ombrothermic index.....(Io):	1.73
Monthly dry ombrothermic index.....(Iod1):	No
Bimonthly dry ombrothermic index.....(Iod2):	No
Three monthly dry ombrothermic index.....(Iod3):	0.03
Four monthly dry ombrothermic index.....(Iod4):	0.09
Annual ombro-evaporation index.....(Ioe):	11.99
Annual positive temperature.....(Tp):	2667
Annual negative temperature.....(Tn):	0
Dry station temperature.....(Td):	489
Positive precipitation.....(Pp):	462

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

Latitudinal Belt...: Eutropical

Continentalty.....: Oceanic - High Semihyperoceanic

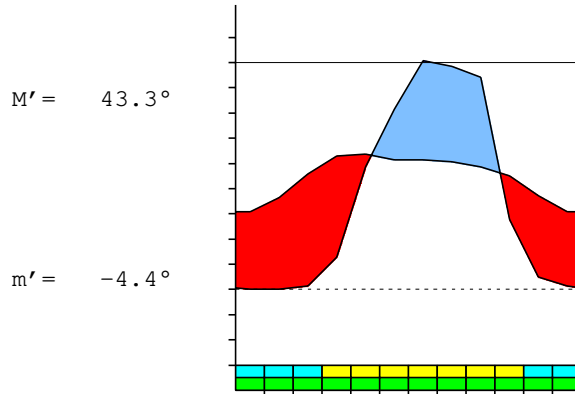
Bioclimate(Variant): TROPICAL XERIC (SEMIARID)

Bioclimatic Belt...: UPPER THERMOTROPICAL UPPER SEMIARID

MAUN (BOTSWANA)

945 m

P= 462      19° 59'S      23° 25'E      26/21 y.  
 T= 22.2°    Ic= 11.4      Tp= 2667      Tn= 0  
 m= 5.6°      M= 25.0°      Itc= 528      Io= 1.7



TROPICAL XERIC (SEMIARID)  
 UPPER THERMOTROPICAL UPPER SEMIARID

WATER INDEX CARD      MAUN (BOTSWANA)  
 Altitude: 945 m.      Latitude: 19° 59'S

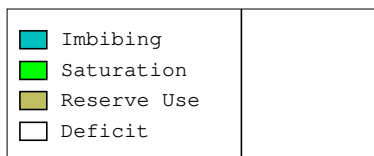
(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jul.	15.3	31	0	0	0	0	31	0	0	-1.0
Aug.	18.3	52	0	0	0	0	52	0	0	-1.0
Sep.	22.8	92	1	0	0	1	90	0	0	-0.9
Oct.	26.4	146	13	0	0	13	134	0	0	-0.9
Nov.	26.7	149	48	0	0	48	101	0	0	-0.6
Dec.	25.8	146	71	0	0	71	75	0	0	-0.5
Jan.	25.6	141	109	0	0	109	32	0	0	-0.2
Feb.	25.3	120	97	0	0	97	24	0	0	-0.1
Mar.	24.2	112	89	0	0	89	23	0	0	-0.2
Apr.	22.5	86	28	0	0	28	58	0	0	-0.6
May.	18.6	52	5	0	0	5	47	0	0	-0.9
Jun.	15.3	30	1	0	0	1	28	0	0	-0.9
Year	22.2	1157	462	*	*	462	694	0	0	*

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

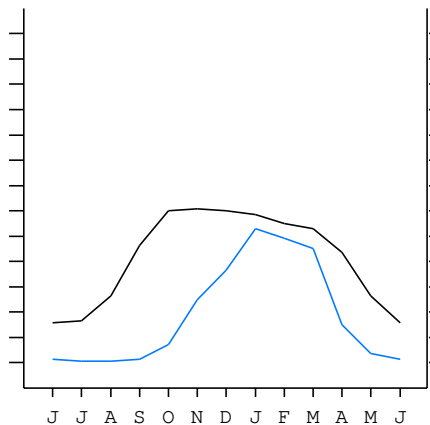
MAUN (BOTSWANA)

19°59'S    23°25'E    945 m 26/21 y.

T= 22.2    Ic= 11.4    TROPICAL XERIC (SEMIARID)  
 m= 5.6    Tp= 2667    UPPER THERMOTROPICAL  
 M= 25.0    Tn= 0    UPPER SEMIARID  
 M' = 43.3    Itc= 528  
 m' = -4.4    Io= 1.7  
 P= 462    mm    ———  
 PE= 1157    mm    ———



All over the year,  
 there is hydric deficit



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SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

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

Thermic types [A2.A2]  
 + Latitudinal zone ....: A. Warm  
 + Latitudinal belt ....: 2. Eutropical  
 + Thermic type .....: A. Warm  
 + Thermic subtype .....: 2. Warm

Bioclimatic types [A3.2a.4a]  
 + Macrobioclimate .....: A. TROPICAL  
 + Bioclimate .....: 3. XERIC  
 + Bioclimatic variant ..:  
 + Thermic type.....: 2. THERMOTROPICAL  
 + Thermic subtype.....: a. UPPER  
 + Ombrothermic type ...: 4. SEMIARID  
 + Ombrothermic subtype : a. UPPER

Bioclimatic Classification .....: Trxe.Ttr.Sar

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 427  
 Coldest semester of the year.....(Psw): 36  
 Warmest four months period of the year.....(Pcm1): 241  
 Following warmest four months period.....(Pcm2): 218  
 Positive precipitation dryest 3 months.....(Ppd): 1  
 Positive precipitation dryest 2 months.....(Ppd2): 0  
 Positive precipitation dryest 1 month.....(Ppd1): 0  
 Positive precipitation warmest 3 months.....(Pps): 132  
 Positive precipitation warmest 2 months.....(Pps2): 61  
 Positive precipitation warmest 1 month.....(Pps1): 48  
 Positive precipitation coldest 3 months.....(Ppw): 1  
 Positive precipitation coldest 2 months.....(Ppw2): 1  
 Positive precipitation coldest 1 month.....(Ppw1): 1

Seasons	Jun+Jul+Aug Ttr3-3	Sep+Oct+Nov Ttr4-4	Dec+Jan+Feb Ttr1-1	Mar+Apr+May Ttr2-2
Rainfall	1	62	276	121

Tropical rainfall rhythms: 1 > 2 > 4 > 3

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 26.7  
 Average coldest month [T].....(Tmin): 15.3  
 Maximum temp. warmest month [M].....(Tmmax): 35.0  
 Minimum temp. coldest month [m].....(Tmmin): 5.6  
 Absolute Max.temp. warmest month [M'].....(Tamax): 43.3  
 Absolute Min.temp. coldest month [m'].....(Tamin): -4.4  
 First warmest contrasted month [M].....(Tcmax): 28.3 (8)  
 First coldest contrasted month [m].....(Tcmin): 8.3 (8)  
 Dry station temperature.....(Td): 489  
 Positive temperature dryest 3 months.....(Tpd): 489  
 Positive temperature dryest 2 months.....(Tpd2): 336  
 Positive temperature dryest 1 month.....(Tpd1): 153  
 Positive temperature warmest 3 months.....(Tps): 789  
 Positive temperature warmest 2 months.....(Tps2): 531  
 Positive temperature warmest 1 month.....(Tps1): 267  
 Positive temperature coldest 3 months.....(Tpw): 489  
 Positive temperature coldest 2 months.....(Tpw2): 306  
 Positive temperature coldest 1 month.....(Tpw1): 153

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

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OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 2.50  
 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)	711	1092	965	889	279	51	13	0	0	13	127	483
Tp	258	256	253	242	225	186	153	153	183	228	264	267
Io (Iom)	2.75	4.27	3.82	3.68	1.24	0.27	0.09	0.00	0.00	0.06	0.48	1.81
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp(x10)/Tp	2768 / 767			1219 / 653			13 / 489			623 / 758		
Io (Iot)	3.610			1.867			0.027			0.821		
Semesters	December-May						June-November					
Pp(x10)/Tp	3987 / 1420						636 / 1247					
Io (Iosm)	2.809						0.510					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 4623/2667=1.73 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	711	1092	965	889	279	51	13	0	0	13	127	483
Tp [T*10]	258	256	253	242	225	186	153	153	183	228	264	267
Iom [Pp/Tp]	275	427	382	368	124	27	9	0	0	6	48	181
Avm [200-Iom]	***	***	***	***	76	173	191	200	200	194	152	19
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp / Tp	2768 / 767			1219 / 653			13 / 489			623 / 758		
Iot [Pp/Tp]	361			187			3			82		
Avs E[Avm<200]	***			***			591			365		
Lower ultrahyperarid [5]						Lower hyperarid [1]						
Strong lower arid [1]						Strong upper arid [1]						
Weak lower semiarid [1]						Weak upper semiarid [1]						

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....(Sp): 11.39  
 CI of Gorezinski (1920) [1.7\*Sp/sin(Lat)-20.4] .....: 36.26  
 CI of Conrad (1946) [1.7\*Sp/sin(Lat+10)-14] .....: 24.75  
 + Oceanic (20<CI<40)  
 CI of Currey (1974) [CI=Sp/(1+Lat/3)] .....: 1.49  
 + Subcontinental (1.1<CI<1.7)  
 Rainfall Index of Lang (1925) [R=P/T] .....: 20.80  
 + Steppic (40>R>0)  
 Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....: 14.35  
 + Arid -steppic- (15>Ia>5)  
 I of Emberger (1930) [Q=100\*P/(Tmax<sup>2</sup>-Tmin<sup>2</sup>)] .....: 38.72  
 + Semiarid (50>Q>30)  
 I of Dantin & Revenga (1940) [DR=100\*T/P] .....: 4.81  
 + Arid (6>DR>3)  
 Aridity Index of UNEP [I=P/PE] .....: 0.40  
 + Semiarid (0.5>Im>0.2)  
 Potential Erosion I of Fournier (1960) [K=Pi<sup>2</sup>/P].....: 25.79  
 + Very low (K<60)

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BIOCLIMATIC INDICES II

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

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.40	0.35	0.33	0.09	0.02	0.00	0.00	0.00	0.00	0.04	0.16	0.25
T-E ratio	11.50	11.38	10.88	10.13	8.37	6.88	6.88	8.25	10.25	11.88	12.00	11.63
Precipitation-effectiveness: 16.44						Temperature-efficiency .....: 120.01						
Moisture Index [MI=100*(P-PE)/PE] .....: -60.03 + D.Semiarid (-66.7<MI<-33.3) Index of dryness [DI=100*d/PE] .....: 60.03 + Strong deficit (33.3<DI) Index of humidity [HI=100*s/PE] .....: 0.00 + No surplus (0<HI<10) Potential Evapotranspiration PE .....: 1156.62 + Forth mesothermic (997<PE<1440)												

