

# Phytosociological Research Center

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## Worldwide Bioclimatic Classification System

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(Adapted to Synoptical Table 14/02/2020)

SAN ANTONIO ISCAYACHI (BOLIVIA) Altitude: 3450 m.

Latitude: 21°26'S Longitude: 64°58'W

Temperature observation period.: 1978-1989 (12)

Rainfall observation period....: 1978-1989 (12)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPI
Jan.	12.00	16.20	7.70	23.00	1.00	89.0	63.12
Feb.	11.90	16.40	7.30	23.40	0.00	72.0	54.37
Mar.	11.90	16.80	7.20	25.00	2.00	60.0	57.08
Apr.	11.60	17.80	5.00	24.00	-2.00	14.0	51.22
May.	10.50	17.40	3.60	23.40	-6.00	1.0	44.79
Jun.	9.90	16.30	3.40	21.00	-8.00	0.0	40.12
Jul.	9.50	16.40	2.60	21.00	-9.00	1.0	39.54
Aug.	10.30	17.20	3.40	24.00	-11.00	4.0	46.12
Sep.	10.60	17.30	3.30	23.20	-4.00	5.0	47.65
Oct.	11.80	18.10	5.40	24.00	-2.10	15.0	58.69
Nov.	12.10	17.80	6.60	25.40	-1.20	31.0	60.39
Dec.	12.00	16.80	7.20	23.20	1.00	78.0	63.12
Year	11.18	17.04	5.22	23.38	-3.27	370	626.22

### BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	302
Compensated thermicity index.....(Itc):	302
Simple continentality index.....(Ic):	2.6
Diurnality index.....(Id):	14.0
Annual ombrothermic index.....(Io):	2.76
Monthly dry ombrothermic index.....(Iod1):	No
Bimonthly dry ombrothermic index.....(Iod2):	0.05
Threemonthly dry ombrothermic index.....(Iod3):	0.07
Fourmonthly dry ombrothermic index.....(Iod4):	0.39
Annual ombro-evaporation index.....(Ioe):	0.59
Annual positive temperature.....(Tp):	1341
Annual negative temperature.....(Tn):	0
Dry station temperature.....(Td):	299
Positive precipitation.....(Pp):	370

N. of Months	P>4T	P:2T-4T	PT-2T	P<T	T<0
	4	1	2	5	0

Latitudinal Belt...: Eutropical

Continentality.....: Hyperoceanic - Low Ultrahyperoceanic

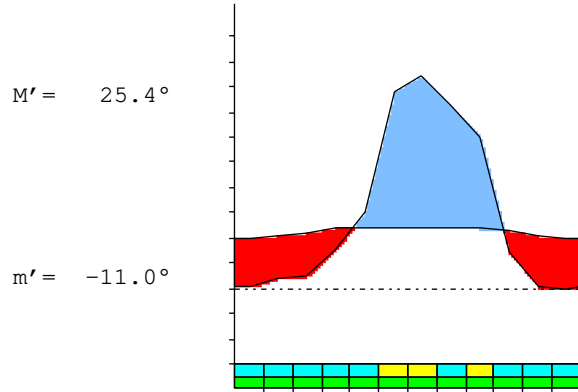
Bioclimate(Variant): TROPICAL XERIC (DRY)

Bioclimatic Belt...: LOW SUPRATROPICAL LOW DRY

SAN ANTONIO ISCAYACHI (BOLIVIA)

3450 m

P= 370      21° 26'S      64° 58'W      12/12 y.  
 T= 11.2 °    Ic= 2.6      Tp= 1341      Tn= 0  
 m= 2.6 °      M= 16.4 °    Itc= 302      Io= 2.8



TROPICAL XERIC (DRY)  
 LOW SUPRATROPICAL LOW DRY

WATER INDEX CARD      SAN ANTONIO ISCAYACHI (BOLIVIA)

Altitude: 3450 m.      Latitude: 21° 26'S

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jul.	9.5	40	1	0	0	1	39	0	0	-0.9
Aug.	10.3	46	4	0	0	4	42	0	0	-0.9
Sep.	10.6	48	5	0	0	5	43	0	0	-0.8
Oct.	11.8	59	15	0	0	15	44	0	0	-0.7
Nov.	12.1	60	31	0	0	31	29	0	0	-0.4
Dec.	12.0	63	78	15	15	63	0	0	0	0.2
Jan.	12.0	63	89	26	41	63	0	0	0	0.4
Feb.	11.9	54	72	18	58	54	0	0	0	0.3
Mar.	11.9	57	60	3	61	57	0	0	0	0.0
Apr.	11.6	51	14	-37	24	51	0	0	0	-0.7
May.	10.5	45	1	-24	0	25	20	0	0	-0.9
Jun.	9.9	40	0	0	0	0	40	0	0	-1.0
Year	11.2	626	370	*	*	370	256	0	0	*

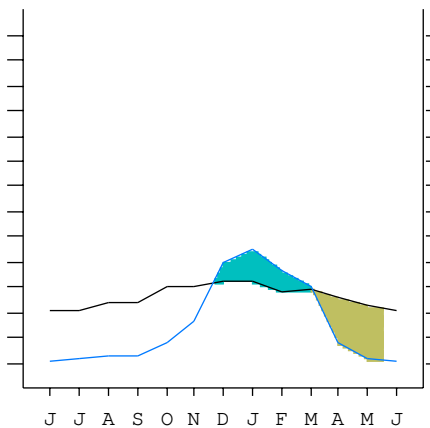
R = Reserve    VR = Variation of the reserve    RE = Real evapotranspiration  
 DR = Drainage    HC = Humidity coefficient    DF = Deficit    SP = Superavit

SAN ANTONIO ISCAYACHI (BOLIVIA)

21°26'S    64°58'W    3450 m    12/12 y.

T= 11.2    Ic= 2.6    TROPICAL XERIC (DRY)  
 m= 2.6    Tp= 1341    LOW SUPRATROPICAL  
 M= 16.4    Tn= 0    LOW DRY  
 M' = 25.4    Itc= 302  
 m' = -11.0    Io= 2.8  
 P= 370    mm ———  
 PE= 626    mm ———

Imbibing	20 Nov.
Saturation	
Reserve Use	3 Mar.
Deficit	17 May.



SAN ANTONIO ISCAYACHI (BOLIVIA)

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SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continentality Index [A1b]  
 + Type .....: A. Hyperoceanic  
 + Subtype .....: 1. Ultrahyperoceanic  
 + Variant .....: b. Low  
 Thermic types [A2.B4]  
 + Latitudinal zone ....: A. Warm  
 + Latitudinal belt ....: 2. Eutropical  
 + Thermic type .....: B. Temperate  
 + Thermic subtype .....: 4. Temperate  
 Bioclimatic types [A3.4b.5b]  
 + Macrobioclimate .....: A. TROPICAL  
 + Bioclimate .....: 3. XERIC  
 + Bioclimatic variant .: DRY  
 + Thermic type.....: 4. SUPRATROPICAL  
 + Thermic subtype.....: b. LOW  
 + Ombrothermic type ...: 5. DRY  
 + Ombrothermic subtype : b. LOW  
 Bioclimatic Classification .....Trxe (Dry).Str.Dry.Uho

SAN ANTONIO ISCAYACHI (BOLIVIA)

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 345  
 Coldest semester of the year.....(Psw): 25  
 Warmest four months period of the year.....(Pcm1): 270  
 Following warmest four months period.....(Pcm2): 75  
 Positive precipitation dryest 3 months.....(Ppd): 2  
 Positive precipitation dryest 2 months.....(Ppd2): 1  
 Positive precipitation dryest 1 month.....(Ppd1): 0  
 Positive precipitation warmest 3 months.....(Pps): 198  
 Positive precipitation warmest 2 months.....(Pps2): 109  
 Positive precipitation warmest 1 month.....(Pps1): 31  
 Positive precipitation coldest 3 months.....(Ppw): 5  
 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	5	51	239	75

Tropical rainfall rhythms: 1 > 2 > 4 > 3

SAN ANTONIO ISCAYACHI (BOLIVIA)

Latitude: 21°26'S Longitude: 64°58'W Altitude: 3450 m

TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 12.1  
 Average coldest month [T].....(Tmin): 9.5  
 Maximum temp. warmest month [M].....(Tmmax): 18.1  
 Minimum temp. coldest month [m].....(Tmmin): 2.6  
 Absolute Max.temp. warmest month [M'].....(Tamax): 25.4  
 Absolute Min.temp. coldest month [m'].....(Tamin): -11.0  
 First warmest contrasted month [M].....(Tcmax): 17.3 (9)  
 First coldest contrasted month [m].....(Tcmin): 3.3 (9)  
 Dry station temperature.....(Td): 299  
 Positive temperature dryest 3 months.....(Tpd): 299  
 Positive temperature dryest 2 months.....(Tpd2): 204  
 Positive temperature dryest 1 month.....(Tpd1): 99  
 Positive temperature warmest 3 months.....(Tps): 361  
 Positive temperature warmest 2 months.....(Tps2): 241  
 Positive temperature warmest 1 month.....(Tps1): 121  
 Positive temperature coldest 3 months.....(Tpw): 297  
 Positive temperature coldest 2 months.....(Tpw2): 194  
 Positive temperature coldest 1 month.....(Tpw1): 95

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

SAN ANTONIO ISCAYACHI (BOLIVIA)

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OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 1.69  
 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)	780	890	720	600	140	10	0	10	40	50	150	310
Tp	120	120	119	119	116	105	99	95	103	106	118	121
Io (Iom)	6.50	7.42	6.05	5.04	1.21	0.10	0.00	0.11	0.39	0.47	1.27	2.56
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp(x10)/Tp	2390 / 359			750 / 340			50 / 297			510 / 345		
Io (Iot)	6.657			2.206			0.168			1.478		
Semesters	December-May						June-November					
Pp(x10)/Tp	3140 / 699						560 / 642					
Io (Iosm)	4.492						0.872					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 3700/1341=2.76 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	780	890	720	600	140	10	0	10	40	50	150	310
Tp [T*10]	120	120	119	119	116	105	99	95	103	106	118	121
Iom [Pp/Tp]	650	742	605	504	121	10	0	11	39	47	127	256
Avm [200-Iom]	***	***	***	***	79	190	200	189	161	153	73	***
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp / Tp	2390 / 359			750 / 340			50 / 297			510 / 345		
Iot [Pp/Tp]	666			221			17			148		
Avs E[Avm<200]	***			***			551			***		
Lower ultrahyperarid [2]							Upper ultrahyperarid [2]					
Upper hyperarid [1]							Strong lower arid [1]					
Weak lower semiarid [2]												

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....(Sp): 2.60  
 CI of Gorezinski (1920) [1.7\*Sp/sin(Lat)-20.4] .....: -8.30  
 CI of Conrad (1946) [1.7\*Sp/sin(Lat+10)-14] .....: -5.52  
 + Hyperoceanic (-20<CI<20)  
 CI of Currey (1974) [CI=Sp/(1+Lat/3)] .....: 0.32  
 + Hyperoceanic (0<CI<0.6)  
 Rainfall Index of Lang (1925) [R=P/T] .....: 33.11  
 + Steppic (40>R>0)  
 Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....: 17.47  
 + Semiarid -mediterranean- (20>Ia>15)  
 I of Emberger (1930) [Q=100\*P/(Tmax<sup>2</sup>-Tmin<sup>2</sup>)] .....: 115.32  
 + Humid (Q>90)  
 I of Dantin & Revenga (1940) [DR=100\*T/P] .....: 3.02  
 + Arid (6>DR>3)  
 Aridity Index of UNEP [I=P/PE] .....: 0.59  
 + Subhumid - dry (0.65>I>0.5)  
 Potential Erosion I of Fournier (1960) [K=Pi<sup>2</sup>/P].....: 21.41  
 + 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. Termoxeroteric (Mediterranean warm)  
 + Thermic type: 4. Mesothermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.46	0.36	0.30	0.06	0.00	0.00	0.00	0.02	0.02	0.06	0.14	0.40
T-E ratio	5.40	5.35	5.35	5.22	4.72	4.45	4.27	4.64	4.77	5.31	5.45	5.40
Precipitation-effectiveness: 18.24						Temperature-efficiency .....: 60.35						
Moisture Index [MI=100*(P-PE)/PE] .....: -40.92 + D.Semiarid (-66.7<MI<-33.3)												
Index of dryness [DI=100*d/PE] .....: 40.91 + Strong deficit (33.3<DI)												
Index of humidity [HI=100*s/PE] .....: 0.00 + No surplus (0<HI<10)												
Potential Evapotranspiration PE .....: 626.22 + First mesothermic (570<PE<712)												

