

Phytosociological Research Center

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Worldwide Bioclimatic Classification System

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

(Adapted to Synoptical Table 14/02/2020)

SUNDSVALL (SWEDEN)

Altitude: 4 m.

Latitude: 62°31'N Longitude: 17°26'E

Temperature observation period.: 1989-1994 (6)

Rainfall observation period....: 1985-1994 (10)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPI
Jan.	-6.39	-3.89	-8.89	8.89	-32.22	65.3	0.00
Feb.	-6.39	-2.78	-10.00	8.89	-27.78	67.6	0.00
Mar.	-2.50	1.67	-6.67	12.78	-21.11	40.4	0.00
Apr.	1.39	6.11	-3.33	17.78	-16.11	27.4	14.39
May.	7.50	12.22	2.78	22.22	-2.78	236.5	73.84
Jun.	12.22	17.22	7.22	27.78	0.00	41.9	119.48
Jul.	15.56	20.56	10.56	31.11	2.78	83.6	142.74
Aug.	14.44	19.44	9.44	28.89	2.22	50.5	114.60
Sep.	10.56	14.44	6.67	26.11	-3.89	57.9	68.22
Oct.	5.28	8.33	2.22	17.78	-8.89	76.7	29.82
Nov.	0.28	2.22	-1.67	10.00	-18.89	68.8	1.69
Dec.	-4.72	-2.78	-6.67	7.22	-22.78	90.7	0.00
Year	3.94	7.73	0.14	18.29	-12.45	907	564.78

BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	-88
Compensated thermicity index.....(Itc):	-59
Simple continentality index.....(Ic):	22.0
Diurnality index.....(Id):	10.0
Annual ombrothermic index.....(Io):	9.57
Monthly estival ombrothermic index.....(Ios1):	5.37
Bimonthly estival ombrothermic index.....(Ios2):	4.47
Threemonthly estival ombrothermic index.....(Ios3):	4.17
Fourmonthly estival ombrothermic index.....(Ios4):	8.30
Annual ombro-evaporation index.....(Ioe):	1.61
Annual positive temperature.....(Tp):	672
Annual negative temperature.....(Tn):	200
Estival temperature.....(Ts):	422
Positive precipitation.....(Pp):	643

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

Latitudinal Belt....: High Subtemperate

Continentality.....: Continental - Low Subcontinental

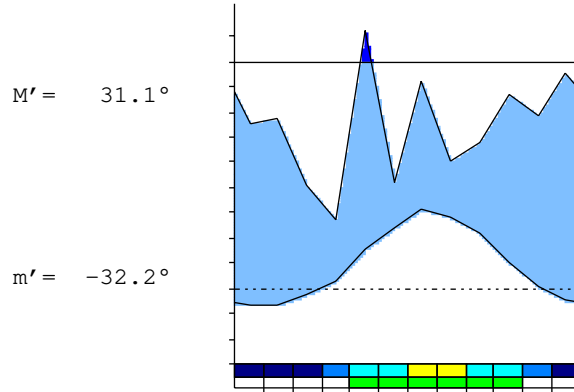
Bioclimate.....: BOREAL SUBCONTINENTAL

Bioclimatic Belt....: LOW MESOBOREAL UPPER HUMID

SUNDSVALL (SWEDEN)

4 m

P= 907 62° 31'N 17° 26'E 6/10 y.
 T= 3.9 ° Ic= 22.0 Tp= 672 Tn= 200
 m= -8.9 ° M= -3.9 ° Itc= -59 Io= 9.6



BOREAL SUBCONTINENTAL
 LOW MESOBOREAL UPPER HUMID

WATER INDEX CARD SUNDSVALL (SWEDEN)
 Altitude: 4 m. Latitude: 62° 31'N

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jan.	-6.4	0	65	0	100	0	0	65	57	*
Feb.	-6.4	0	68	0	100	0	0	68	63	*
Mar.	-2.5	0	40	0	100	0	0	40	51	*
Apr.	1.4	14	27	0	100	14	0	13	32	0.9
May.	7.5	74	237	0	100	74	0	163	97	2.2
Jun.	12.2	119	42	-78	22	119	0	0	49	-0.6
Jul.	15.6	143	84	-22	0	106	37	0	24	-0.4
Aug.	14.4	115	51	0	0	51	64	0	12	-0.5
Sep.	10.6	68	58	0	0	58	10	0	6	-0.1
Oct.	5.3	30	77	47	47	30	0	0	3	1.5
Nov.	0.3	2	69	53	100	2	0	14	9	39.6
Dec.	-4.7	0	91	0	100	0	0	91	50	*
Year	3.9	565	907	*	*	454	111	454	454	*

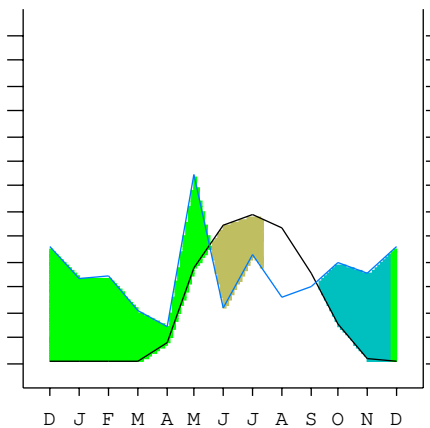
R = Reserve VR = Variation of the reserve RE = Real evapotranspiration
 DR = Drainage HC = Humidity coefficient DF = Deficit SP = Superavit

SUNDSVALL (SWEDEN)

62°31'N 17°26'E 4 m 6/10 y.

T= 3.9 Ic= 22.0 BOREAL SUBCONTINENTAL
 m= -8.9 Tp= 672 LOW MESOBOREAL
 M= -3.9 Tn= 200 UPPER HUMID
 M' = 31.1 Itc= -59
 m' = -32.2 Io= 9.6
 P= 907 mm ———
 PE= 565 mm ———

Imbibing	6 Sep.
Saturation	24 Nov.
Reserve Use	21 May.
Deficit	12 Jul.



SUNDSVALL (SWEDEN)

Latitude: 62°31'N Longitude: 17°26'E Altitude: 4 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continentality Index [C2a]
 + Type: C. Continental
 + Subtype: 2. Subcontinental
 + Variant: a. Low

Thermic types [B2.C6]
 + Latitudinal zone: B. Temperate
 + Latitudinal belt: 2. High Subtemperate
 + Thermic type: C. Cold
 + Thermic subtype: 6. Cool

Bioclimatic types [D4.3b.7a]
 + Macrobioclimate: D. BOREAL
 + Bioclimate: 4. SUBCONTINENTAL
 + Bioclimatic variant .:
 + Thermic type.....: 3. MESOBOREAL
 + Thermic subtype.....: b. LOW
 + Ombrothermic type ...: 7. HUMID
 + Ombrothermic subtype : a. UPPER

Bioclimatic ClassificationBosc.Mbo.Hum.Suc

SUNDSVALL (SWEDEN)

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 547
 Coldest semester of the year.....(Psw): 360
 Warmest four months period of the year.....(Pcm1): 234
 Following warmest four months period.....(Pcm2): 302
 Positive precipitation dryest 3 months.....(Ppd): 27
 Positive precipitation dryest 2 months.....(Ppd2): 27
 Positive precipitation dryest 1 month.....(Ppd1): 27
 Positive precipitation warmest 3 months.....(Pps): 176
 Positive precipitation warmest 2 months.....(Pps2): 134
 Positive precipitation warmest 1 month.....(Pps1): 84
 Positive precipitation coldest 3 months.....(Ppw): 0
 Positive precipitation coldest 2 months.....(Ppw2): 0
 Positive precipitation coldest 1 month.....(Ppw1): 0

Seasons	Winter Tr1-W	Spring Tr2-P	Summer Tr3-S	Automn Tr4-F
Rainfall	223	304	176	203

Seasonal rainfall rhythms: P > W > F > S

SUNDSVALL (SWEDEN)

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 15.6
 Average coldest month [T].....(Tmin): -6.4
 Maximum temp. warmest month [M].....(Tmax): 20.6
 Minimum temp. coldest month [m].....(Tmin): -10.0
 Absolute Max.temp. warmest month [M'].....(Tamax): 31.1
 Absolute Min.temp. coldest month [m'].....(Tamin): -32.2
 First warmest contrasted month [M].....(Tcmax): 17.2 (6)
 First coldest contrasted month [m].....(Tcmin): 7.2 (6)
 Estival temperature.....(Ts): 422
 Positive temperature dryest 3 months.....(Tpd): 14
 Positive temperature dryest 2 months.....(Tpd2): 14
 Positive temperature dryest 1 month.....(Tpd1): 14
 Positive temperature warmest 3 months.....(Tps): 422
 Positive temperature warmest 2 months.....(Tps2): 300
 Positive temperature warmest 1 month.....(Tps1): 156
 Positive temperature coldest 3 months.....(Tpw): 0
 Positive temperature coldest 2 months.....(Tpw2): 0
 Positive temperature coldest 1 month.....(Tpw1): 0

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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		
Ultragelid... [M' <=0] (Pf)												
Hypergelid... [M <=0] (Pf)	o	o										o
Gelid..... [T <=0] (Pf)	o	o	o									o
Subgelid..... [m <=0] (Pf)	o	o	o	o							o	o
Pregelid..... [m' <=0] (Pf)	o	o	o	o	o	o			o	o	o	o
Agelid..... [m' > 0] (Pf)							o	o				
HiperAgelid.. [all >0] (Pf)							o	o				

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OMBROTHERMIC PARAMETERS

Annual aridity index. [PE/P]..... (Iar): 0.62
 Mediterranean index of July. [PE/P]..... (Im1): 1.71
 Mediterranean index of July & August..... (Im2): 1.92
 Mediterranean index of June, July & August.... (Im3): 2.14

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp (x10)	*	*	*	*	274	2365	419	836	505	579	767	688
Tp	*	*	*	*	14	75	122	156	144	106	53	3
Io (Iom)	*	*	*	*	19.7	31.5	3.43	5.37	3.50	5.48	14.5	246
Seasons	Winter			Spring			Summer			Autumn		
Pp (x10) / Tp	* / *			* / *			1760 / 422			2034 / 161		
Io (Iot)	*			*			4.169			12.62		
Semesters	December-May						June-November					
Pp (x10) / Tp	* / *						3794 / 583					
Io (Iosm)	*						6.503					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 6433/672=9.57 There is No Yearly Aridity

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	*	*	*	*	274	2365	419	836	505	579	767	688
Tp [T*10]	*	*	*	*	14	75	122	156	144	106	53	3
Iom [Pp/Tp]	!!	!!	!!	!!	\$\$	\$\$	343	537	350	548	\$\$	\$\$
Avm [200-Iom]	***	***	***	***	***	***	***	***	***	***	***	***
Seasons	Winter			Spring			Summer			Autumn		
Pp / Tp	* / *			* / *			1760 / 422			2034 / 161		
Iot [Pp/Tp]	**			**			417			1262		
Avs E [Avm < 200]	***			***			***			***		

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin](Sp): 21.95
 CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4]: 21.66
 CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14]: 25.12
 + Oceanic (20<CI<40)
 CI of Currey (1974) [CI=Sp/(1+Lat/3)]: 1.01
 + Oceanic (0.6<CI<1.1)
 Rainfall Index of Lang (1925) [R=P/T]: 230.52
 + Humid (R>160)
 Aridity Index of Martonne (1926) [Ia=P/(T+10)]: 65.11
 + Perhumid (Ia>60)
 I of Emberger (1930) [Q=100*P/(Tmmax²-Tmmin²)]: 281.15
 + Humid (Q>90)
 I of Dantin & Revenga (1940) [DR=100*T/P]: 0.43
 + Humid (2>DR>0)
 Aridity Index of UNEP [I=P/PE]: 1.61
 + Humid (I>0.65)
 Potential Erosion I of Fournier (1960) [K=Pi²/P].....: 61.65
 + Low (60<K<90)

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BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)
 + Climate: B. Cold and temperate cold
 + Region: 11. Psicroaxeric (Axeric cold)
 + Thermic type: 6. Microthermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.57	0.59	0.33	0.18	1.58	0.20	0.38	0.23	0.30	0.49	0.54	0.82
T-E ratio	0.00	0.00	0.00	0.63	3.38	5.50	7.00	6.50	4.75	2.38	0.13	0.00
Precipitation-effectiveness: 62.24						Temperature-efficiency: 30.25						
Moisture Index [MI=100*(P-PE)/PE]: 60.65 + B3.Humid high-humid (60<MI<80)												
Index of dryness [DI=100*d/PE]: 19.67 + Moderate deficit (16.7<DI<33.3)												
Index of humidity [HI=100*s/PE]: 80.31 + Strong surplus (20<HI)												
Potential Evapotranspiration PE: 564.78 + Second microthermic (427<PE<570)												

