

# Phytosociological Research Center

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## Worldwide Bioclimatic Classification System

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(Adapted to Synoptical Table 14/02/2020)

SATU-MARE (ROMANIA)

Altitude: 130 m.

Latitude: 47°48'N Longitude: 22°53'E

Temperature observation period.: 1978-1994 (17)

Rainfall observation period....: 1978-1994 (17)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	Epi
Jan.	-3.34	0.00	-6.67	12.22	-28.89	45.7	0.00
Feb.	-1.39	2.22	-5.00	17.22	-27.22	40.6	0.00
Mar.	4.17	8.89	-0.56	22.22	-17.78	39.9	15.31
Apr.	10.56	16.11	5.00	27.78	-6.11	49.3	51.66
May.	15.00	21.11	8.89	32.78	-1.11	55.4	90.11
Jun.	18.89	25.00	12.78	36.11	3.89	80.5	120.35
Jul.	20.56	26.67	14.44	36.11	6.11	60.5	134.10
Aug.	20.00	26.11	13.89	38.89	6.11	60.7	119.11
Sep.	16.39	22.78	10.00	33.89	0.00	30.2	80.25
Oct.	11.11	17.22	5.00	27.78	-6.11	34.8	44.77
Nov.	5.83	9.44	2.22	22.22	-10.00	48.8	17.22
Dec.	0.83	3.33	-1.67	15.00	-27.22	66.6	1.59
Year	9.88	14.91	4.86	26.85	-9.03	613	674.47

### BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	32
Compensated thermicity index.....(Itc):	91
Simple continentality index.....(Ic):	23.9
Diurnality index.....(Id):	12.8
Annual ombrothermic index.....(Io):	4.27
Monthly estival ombrothermic index.....(Ios1):	2.94
Bimonthly estival ombrothermic index.....(Ios2):	2.99
Threemonthly estival ombrothermic index.....(Ios3):	3.39
Fourmonthly estival ombrothermic index.....(Ios4):	3.45
Annual ombro-evaporation index.....(Ioe):	0.91
Annual positive temperature.....(Tp):	1233
Annual negative temperature.....(Tn):	47
Estival temperature.....(Ts):	595
Positive precipitation.....(Pp):	527

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

Latitudinal Belt...: High Eutemperate

Continentality.....: Continental - Low Subcontinental

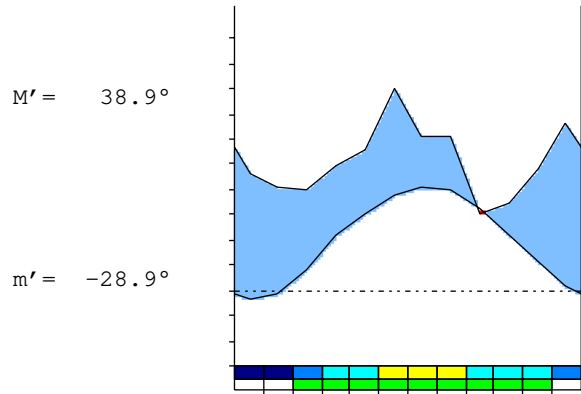
Bioclimate(Variant): TEMPERATE CONTINENTAL (STEPPIC)

Bioclimatic Belt...: LOW SUPRATEMPERATE LOW SUBHUMID

SATU-MARE (ROMANIA)

130 m

P= 613 47° 48'N 22° 53'E 17/17 y.  
 T= 9.9 ° Ic= 23.9 Tp= 1233 Tn= 47  
 m= -6.7 ° M= 0.0 ° Itc= 91 Io= 4.3



TEMPERATE CONTINENTAL (STEPPIC)  
 LOW SUPRATEMPERATE LOW SUBHUMID

WATER INDEX CARD SATU-MARE (ROMANIA)  
 Altitude: 130 m. Latitude: 47° 48'N

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jan.	-3.3	0	46	3	100	0	0	42	21	*
Feb.	-1.4	0	41	0	100	0	0	41	31	*
Mar.	4.2	15	40	0	100	15	0	25	28	1.6
Apr.	10.6	52	49	-2	98	52	0	0	14	0.0
May.	15.0	90	55	-35	63	90	0	0	7	-0.3
Jun.	18.9	120	81	-40	23	120	0	0	3	-0.3
Jul.	20.6	134	61	-23	0	84	51	0	2	-0.5
Aug.	20.0	119	61	0	0	61	58	0	1	-0.4
Sep.	16.4	80	30	0	0	30	50	0	0	-0.6
Oct.	11.1	45	35	0	0	35	10	0	0	-0.2
Nov.	5.8	17	49	32	32	17	0	0	0	1.8
Dec.	0.8	2	67	65	97	2	0	0	0	40.9
Year	9.9	674	613	*	*	506	169	107	107	*

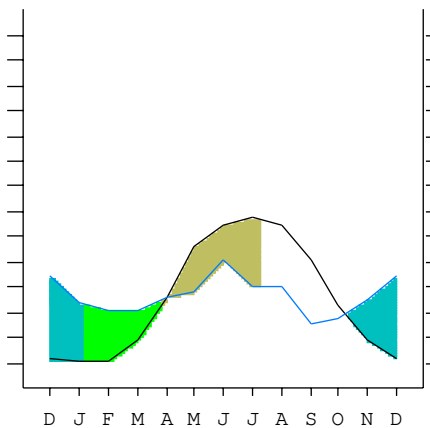
R = Reserve VR = Variation of the reserve RE = Real evapotranspiration  
 DR = Drainage HC = Humidity coefficient DF = Deficit SP = Superavit

SATU-MARE (ROMANIA)

47°48'N 22°53'E 130 m 17/17 y.

T= 9.9 Ic= 23.9 TEMPERATE CONTINENTAL (STEPPIC)  
 m= -6.7 Tp= 1233 LOW SUPRATEMPERATE  
 M= 0.0 Tn= 47 LOW SUBHUMID  
 M' = 38.9 Itc= 91  
 m' = -28.9 Io= 4.3  
 P= 613 mm ———  
 PE= 674 mm ———

Imbibing	8 Oct.
Saturation	3 Jan.
Reserve Use	28 Mar.
Deficit	10 Jul.



SATU-MARE (ROMANIA)

Latitude: 47°48'N Longitude: 22°53'E Altitude: 130 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

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

Thermic types [B1.B5]  
 + Latitudinal zone ....: B. Temperate  
 + Latitudinal belt ....: 1. High Eutemperate  
 + Thermic type .....: B. Temperate  
 + Thermic subtype .....: 5. Subtemperate

Bioclimatic types [C2a.4b.6b]  
 + Macrobioclimate .....: C. TEMPERATE  
 + Bioclimate .....: 2. CONTINENTAL  
 + Bioclimatic variant .: STEPPIC  
 + Thermic type.....: 4. SUPRATEMPERATE  
 + Thermic subtype.....: b. LOW  
 + Ombrothermic type ...: 6. SUBHUMID  
 + Ombrothermic subtype : b. LOW

Bioclimatic Classification .....Teco(Stp).Ste.Shu.Suc

SATU-MARE (ROMANIA)

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 322  
 Coldest semester of the year.....(Psw): 291  
 Warmest four months period of the year.....(Pcm1): 232  
 Following warmest four months period.....(Pcm2): 196  
 Positive precipitation dryest 3 months.....(Ppd): 114  
 Positive precipitation dryest 2 months.....(Ppd2): 65  
 Positive precipitation dryest 1 month.....(Ppd1): 30  
 Positive precipitation warmest 3 months.....(Pps): 202  
 Positive precipitation warmest 2 months.....(Pps2): 121  
 Positive precipitation warmest 1 month.....(Pps1): 61  
 Positive precipitation coldest 3 months.....(Ppw): 67  
 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	152	144	201	113

Seasonal rainfall rhythms: S > W > P > F

SATU-MARE (ROMANIA)

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 20.6  
 Average coldest month [T].....(Tmin): -3.3  
 Maximum temp. warmest month [M].....(Tmax): 26.7  
 Minimum temp. coldest month [m].....(Tmin): -6.7  
 Absolute Max.temp. warmest month [M'].....(Tamax): 38.9  
 Absolute Min.temp. coldest month [m'].....(Tamin): -28.9  
 First warmest contrasted month [M].....(Tcmax): 22.8 (9)  
 First coldest contrasted month [m].....(Tcmin): 10.0 (9)  
 Estival temperature.....(Ts): 595  
 Positive temperature dryest 3 months.....(Tpd): 333  
 Positive temperature dryest 2 months.....(Tpd2): 275  
 Positive temperature dryest 1 month.....(Tpd1): 164  
 Positive temperature warmest 3 months.....(Tps): 595  
 Positive temperature warmest 2 months.....(Tps2): 406  
 Positive temperature warmest 1 month.....(Tps1): 206  
 Positive temperature coldest 3 months.....(Tpw): 8  
 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	o	o	o	
Ultragelid... [M' <=0] (Pf)												
Hypergelid... [M <=0] (Pf)	o											
Gelid... [T <=0] (Pf)	o	o										
Subgelid... [m <=0] (Pf)	o	o	o									o
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				

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OMBROTHERMIC PARAMETERS

Annual aridity index. [PE/P]..... (Iar): 1.10  
 Mediterranean index of July. [PE/P]..... (Im1): 2.22  
 Mediterranean index of July & August..... (Im2): 2.09  
 Mediterranean index of June, July & August.... (Im3): 1.85

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp (x10)	666	*	*	399	493	554	805	605	607	302	348	488
Tp	8	*	*	42	106	150	189	206	200	164	111	58
Io (Iom)	80.2	*	*	9.57	4.67	3.69	4.26	2.94	3.04	1.84	3.13	8.37
Seasons	Winter			Spring			Summer			Autumn		
Pp (x10) / Tp	* / *			1446 / 297			2017 / 594			1138 / 333		
Io (Iot)	*			4.864			3.393			3.414		
Semesters	December-May						June-November					
Pp (x10) / Tp	* / *						3155 / 928					
Io (Iosm)	*						3.401					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 5267/1233=4.27 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	666	*	*	399	493	554	805	605	607	302	348	488
Tp [T*10]	8	*	*	42	106	150	189	206	200	164	111	58
Iom [Pp/Tp]	\$\$	!!	!!	957	467	369	426	294	304	184	313	837
Avm [200-Iom]	***	***	***	***	***	***	***	***	***	16	***	***
Seasons	Winter			Spring			Summer			Autumn		
Pp / Tp	* / *			1446 / 297			2017 / 594			1138 / 333		
Iot [Pp/Tp]	**			486			339			341		
Avs E [Avm < 200]	***			***			***			***		
Weak upper semiarid [1]												

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....	(Sp):	23.90
CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4] .....		34.45
CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14] .....		34.02
+ Oceanic (20<CI<40)		
CI of Currey (1974) [CI=Sp/(1+Lat/3)] .....		1.41
+ Subcontinental (1.1<CI<1.7)		
Rainfall Index of Lang (1925) [R=P/T] .....		62.02
+ Temperate warm (100>R>60)		
Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....		30.83
+ Humid (60>Ia>30)		
I of Emberger (1930) [Q=100*P/(Tmmax <sup>2</sup> -Tmmin <sup>2</sup> )] .....		91.93
+ Humid (Q>90)		
I of Dantin & Revenga (1940) [DR=100*T/P] .....		1.61
+ Humid (2>DR>0)		
Aridity Index of UNEP [I=P/PE] .....		0.91
+ Humid (I>0.65)		
Potencial Erosion I of Fournier (1960) [K=Pi <sup>2</sup> /P].....		10.57
+ Very low (K<60)		

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BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)  
 + Climate .....: B. Cold and temperate cold  
 + Region .....: 10. Psicroxeroterico (Submediterranean)  
 + Thermic type: 5. Meso-microthermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.38	0.33	0.25	0.25	0.25	0.34	0.23	0.24	0.12	0.17	0.29	0.51
T-E ratio	0.00	0.00	1.88	4.75	6.75	8.50	9.25	9.00	7.38	5.00	2.62	0.37
Precipitation-effectiveness: 33.53						Temperature-efficiency .....: 55.50						
Moisture Index [MI=100*(P-PE)/PE] .....												
+ C1.Subhumid dry (-33.3<MI<0)												
Index of dryness [DI=100*d/PE] .....												
+ Moderate deficit (16.7<DI<33.3)												
Index of humidity [HI=100*s/PE] .....												
+ Moderate surplus (10<HI<20)												
Potential Evapotranspiration PE .....												
+ First mesothermic (570<PE<712)												

