

Phytosociological Research Center

www.globalbioclimatics.org

Worldwide Bioclimatic Classification System

Prof.Dr. Salvador Rivas-Martinez

(Adapted to Synoptical Table 30/08/2017)

KUOPIO (FINLAND)

Altitude: 98 m.

Latitude: 63°0'N Longitude: 27°47'E

Temperature observation period.: 1974-1994 (21)

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

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPI
Jan.	-10.00	-7.22	-12.78	5.56	-37.22	43.2	0.00
Feb.	-10.00	-7.22	-12.78	6.11	-37.78	40.6	0.00
Mar.	-5.83	-2.22	-9.44	10.00	-32.22	35.6	0.00
Apr.	0.83	4.44	-2.78	19.44	-22.22	40.6	9.41
May.	7.78	12.22	3.33	27.78	-7.78	45.7	76.30
Jun.	13.06	17.22	8.89	29.44	-2.22	63.5	126.47
Jul.	17.23	21.67	12.78	30.56	5.00	53.3	155.55
Aug.	14.72	18.33	11.11	30.00	2.78	83.8	116.58
Sep.	8.62	11.67	5.56	26.11	-3.33	73.7	57.70
Oct.	2.22	4.44	0.00	17.22	-13.33	68.6	14.53
Nov.	-2.23	-0.56	-3.89	8.89	-21.67	53.3	0.00
Dec.	-6.94	-4.44	-9.44	6.11	-32.22	38.1	0.00
Year	2.46	5.69	-0.79	18.10	-16.85	640	556.54

BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	-175
Compensated thermicity index.....(Itc):	-67
Simple continentality index.....(Ic):	27.2
Diurnality index.....(Id):	8.9
Annual ombrothermic index.....(Io):	6.66
Monthly estival ombrothermic index.....(Ios1):	3.09
Bimonthly estival ombrothermic index.....(Ios2):	4.29
Threemonthly estival ombrothermic index.....(Ios3):	4.46
Fourmonthly estival ombrothermic index.....(Ios4):	4.67
Annual ombro-evaporation index.....(Ioe):	1.55
Annual positive temperature.....(Tp):	645
Annual negative temperature.....(Tn):	350
Estival temperature.....(Ts):	450
Positive precipitation.....(Pp):	429

N. of	P>4T	P:2T-4T	PT-2T	P<T	T<0
Months	6	1	0	0	5

Latitudinal Belt...: High subtemperate

Continentalty.....: Continental - High Subcontinental

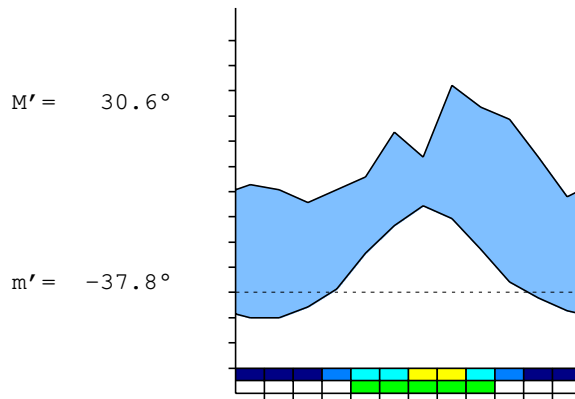
Bioclimate.....: BOREAL SUBCONTINENTAL

Bioclimatic Belt...: LOW MESOBOREAL LOW HUMID

KUOPIO (FINLAND)

98 m

P= 640 63° 0'N 27° 47'E 21/21 y.
 T= 2.5° Ic= 27.2 Tp= 645 Tn= 350
 m= -12.8° M= -7.2° Itc= -67 Io= 6.7



BOREAL SUBCONTINENTAL
 LOW MESOBOREAL LOW HUMID

WATER INDEX CARD KUOPIO (FINLAND)
 Altitude: 98 m. Latitude: 63° 0'N

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jan.	-10.0	0	43	0	100	0	0	43	34	*
Feb.	-10.0	0	41	0	100	0	0	41	37	*
Mar.	-5.8	0	36	0	100	0	0	36	36	*
Apr.	0.8	9	41	0	100	9	0	31	34	3.3
May.	7.8	76	46	-31	69	76	0	0	17	-0.4
Jun.	13.1	126	64	-63	6	126	0	0	8	-0.4
Jul.	17.2	156	53	-6	0	60	96	0	4	-0.6
Aug.	14.7	117	84	0	0	84	33	0	2	-0.2
Sep.	8.6	58	74	16	16	58	0	0	1	0.2
Oct.	2.2	15	69	54	70	15	0	0	1	3.7
Nov.	-2.2	0	53	30	100	0	0	23	12	*
Dec.	-6.9	0	38	0	100	0	0	38	25	*
Year	2.5	557	640	*	*	428	129	212	212	*

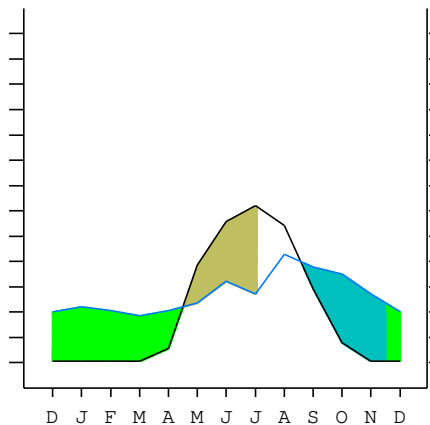
R = Reserve VR = Variation of the reserve RE = Real evapotranspiration
 DR = Drainage HC = Humidity coefficient DF = Deficit SP = Superavit

KUOPIO (FINLAND)

63°0'N 27°47'E 98 m 21/21 y.

T= 2.5 Ic= 27.2 BOREAL SUBCONTINENTAL
 m= -12.8 Tp= 645 LOW MESOBOREAL
 M= -7.2 Tn= 350 LOW HUMID
 M' = 30.6 Itc= -67
 m' = -37.8 Io= 6.7
 P= 640 mm ———
 PE= 557 mm ———

Imbibing	21 Aug.
Saturation	17 Nov.
Reserve Use	16 Apr.
Deficit	2 Jul.



KUOPIO (FINLAND)

Latitude: 63°0'N Longitude: 27°47'E Altitude: 98 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [C2b]
 + Type: C. Continental
 + Subtype: 2. Subcontinental
 + Variant: b. High

Thermic types [B2.C7]
 + Latitudinal zone: B. Temperate
 + Latitudinal belt: 2. High subtemperate
 + Thermic type: C. Cold
 + Thermic subtype: 7. Cold

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

KUOPIO (FINLAND)

Latitude: 63°0'N Longitude: 27°47'E Altitude: 98 m

PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 389
 Coldest semester of the year.....(Psw): 251
 Warmest four months period of the year.....(Pcm1): 274
 Following warmest four months period.....(Pcm2): 203
 Positive precipitation dryest 3 months.....(Ppd): 41
 Positive precipitation dryest 2 months.....(Ppd2): 0
 Positive precipitation dryest 1 month.....(Ppd1): 0
 Positive precipitation warmest 3 months.....(Pps): 201
 Positive precipitation warmest 2 months.....(Pps2): 137
 Positive precipitation warmest 1 month.....(Pps1): 53
 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	121	121	200	195

Seasonal rainfall rhythms: S > F > P > W

KUOPIO (FINLAND)

Latitude: 63°0'N Longitude: 27°47'E Altitude: 98 m

TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 17.2
 Average coldest month [T].....(Tmin): -10.0
 Maximum temp. warmest month [M].....(Tmmax): 21.7
 Minimum temp. coldest month [m].....(Tmmin): -12.8
 Absolute Max.temp. warmest month [M'].....(Tamax): 30.6
 Absolute Min.temp. coldest month [m'].....(Tamin): -37.8
 First warmest contrasted month [M].....(Tcmax): 12.2 (5)
 First coldest contrasted month [m].....(Tcmin): 3.3 (5)
 Estival temperature.....(Ts): 450
 Positive temperature dryest 3 months.....(Tpd): 8
 Positive temperature dryest 2 months.....(Tpd2): 0
 Positive temperature dryest 1 month.....(Tpd1): 0
 Positive temperature warmest 3 months.....(Tps): 450
 Positive temperature warmest 2 months.....(Tps2): 320
 Positive temperature warmest 1 month.....(Tps1): 172
 Positive temperature coldest 3 months.....(Tpw): 0
 Positive temperature coldest 2 months.....(Tpw2): 0
 Positive temperature coldest 1 month.....(Tpw1): 0

KUOPIO (FINLAND)

Latitude: 63°0'N Longitude: 27°47'E Altitude: 98 m

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			
Ultragelid...[M' <=0] (Pf)												
Hypergelid...[M <=0] (Pf)	o	o	o								o	o
Gelid.....[T <=0] (Pf)	o	o	o								o	o
Subgelid.....[m <=0] (Pf)	o	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				

KUOPIO (FINLAND)

Latitude: 63°0'N Longitude: 27°47'E Altitude: 98 m

OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 0.87
 Mediterranean index of July.[PE/P].....(Im1): 2.92
 Mediterranean index of July & August.....(Im2): 1.98
 Mediterranean index of June, July & August....(Im3): 1.99

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	*	*	*	*	406	457	635	533	838	737	686	*
Tp	*	*	*	*	8	78	131	172	147	86	22	*
Io (Iom)	*	*	*	*	48.9	5.87	4.86	3.09	5.69	8.55	30.9	*
Seasons	Winter			Spring			Summer			Autumn		
Pp(x10)/Tp	*/*			*/*			2006 / 450			*/*		
Io (Iot)	*			*			4.457			*		
Semesters	December-May						June-November					
Pp(x10)/Tp	*/*						*/*					
Io (Iosm)	*						*					

KUOPIO (FINLAND)

Latitude: 63°0'N Longitude: 27°47'E Altitude: 98 m

Aridity Value Index (AVI)

[10xPP/TP=IO]: 4292/645=6.66 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	*	*	*	*	406	457	635	533	838	737	686	*
Tp [T*10]	*	*	*	*	8	78	131	172	147	86	22	*
Iom [Pp/Tp]	!!	!!	!!	!!	\$\$	587	486	309	569	855	\$\$!!
Avm [200-Iom]	***	***	***	***	***	***	***	***	***	***	***	***
Seasons	Winter			Spring			Summer			Autumn		
Pp / Tp	* / *			* / *			2006 / 450			* / *		
Iot [Pp/Tp]	**			**			446			**		
Avs E[Avm<200]	***			***			***			***		

KUOPIO (FINLAND)

Latitude: 63°0'N Longitude: 27°47'E Altitude: 98 m

BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin](Sp): 27.23
 CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4]: 31.55
 CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14]: 34.41
 + Oceanic (20<CI<40)
 CI of Currey (1974) [CI=Sp/(1+Lat/3)]: 1.24
 + Subcontinental (1.1<CI<1.7)
 Rainfall Index of Lang (1925) [R=P/T]: 260.69
 + Humid (R>160)
 Aridity Index of Martonne (1926) [Ia=P/(T+10)]: 51.38
 + Humid (60>Ia>30)
 I of Emberger (1930) [Q=100*P/(Tmax²-Tmin²)]: 208.97
 + Humid (Q>90)
 I of Dantin & Revenga (1940) [DR=100*T/P]: 0.38
 + Humid (2>DR>0)
 Aridity Index of UNEP [I=P/PE]: 1.15
 + Humid (I>0.65)
 Potential Erosion I of Fournier (1960) [K=Pi²/P].....: 10.97
 + Very low (K<60)

KUOPIO (FINLAND)

Latitude: 63°0'N Longitude: 27°47'E Altitude: 98 m

BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)
 + Climate: B. Cold and temperate cold
 + Region: 11. Psicroaxeric (Axeric cold)
 + Thermic type: 7. Hipermicrothermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.36	0.34	0.29	0.29	0.25	0.31	0.22	0.40	0.42	0.49	0.45	0.31
T-E ratio	0.00	0.00	0.00	0.37	3.50	5.88	7.75	6.62	3.88	1.00	0.00	0.00
Precipitation-effectiveness: 41.33						Temperature-efficiency: 29.01						
Moisture Index [MI=100*(P-PE)/PE]: 15.00 + C2.Subhumid humid (0<MI<20)												
Index of dryness [DI=100*d/PE]: 23.11 + Moderate deficit (16.7<DI<33.3)												
Index of humidity [HI=100*s/PE]: 38.09 + Strong surplus (20<HI)												
Potential Evapotranspiration PE: 556.54 + Second microthermic (427<PE<570)												

