

Phytosociological Research Center

www.globalbioclimatics.org

Worldwide Bioclimatic Classification System

Prof.Dr. Salvador Rivas-Martinez

(Adapted to Synoptical Table 30/08/2017)

PETROPAVLOVSK (KAZAKHSTAN)

Altitude: 136 m.

Latitude: 54°50'N Longitude: 69°9'E

Temperature observation period.: 1984-1994 (11)

Rainfall observation period....: 1984-1994 (11)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPi
Jan.	-17.22	-13.33	-21.11	0.00	-33.89	12.7	0.00
Feb.	-16.95	-11.67	-22.22	5.00	-40.00	23.9	0.00
Mar.	-8.61	-4.44	-12.78	7.78	-33.89	17.3	0.00
Apr.	3.61	8.33	-1.11	26.11	-22.22	20.8	23.29
May.	12.78	18.89	6.67	35.00	-3.89	38.1	92.83
Jun.	16.95	23.33	10.56	37.22	0.00	57.4	125.39
Jul.	20.00	25.56	14.44	35.00	3.89	65.8	148.11
Aug.	16.67	22.22	11.11	33.89	1.11	70.1	110.45
Sep.	11.12	16.67	5.56	30.00	-3.89	33.8	62.49
Oct.	1.94	5.56	-1.67	21.11	-17.78	36.1	9.76
Nov.	-7.78	-4.44	-11.11	7.78	-33.89	24.9	0.00
Dec.	-15.84	-11.67	-20.00	3.89	-41.11	12.4	0.00
Year	1.39	6.25	-3.47	20.23	-18.80	413	572.32

BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	-331
Compensated thermicity index.....(Itc):	20
Simple continentality index.....(Ic):	37.2
Diurnality index.....(Id):	12.8
Annual ombrothermic index.....(Io):	3.88
Monthly estival ombrothermic index.....(Ios1):	3.29
Bimonthly estival ombrothermic index.....(Ios2):	3.71
Threemonthly estival ombrothermic index.....(Ios3):	3.60
Fourmonthly estival ombrothermic index.....(Ios4):	3.48
Annual ombro-evaporation index.....(Ioe):	2.25
Annual positive temperature.....(Tp):	831
Annual negative temperature.....(Tn):	664
Estival temperature.....(Ts):	536
Positive precipitation.....(Pp):	322

N. of	P>4T	P:2T-4T	PT-2T	P<T	T<0
Months	3	4	0	0	5

Latitudinal Belt...: Low subtemperate

Continentality.....: Continental - High Eucontinental

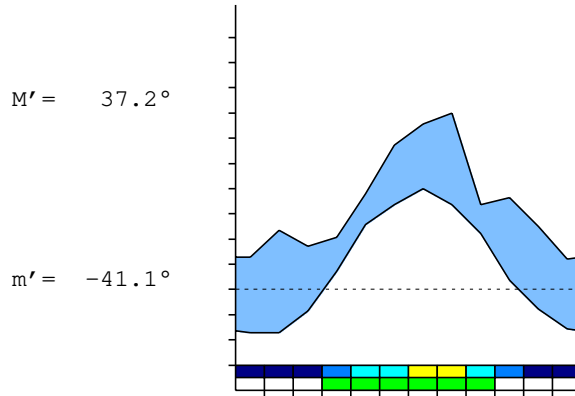
Bioclimate.....: TEMPERATE CONTINENTAL

Bioclimatic Belt...: UPPER SUPRATEMPERATE (HEMIBOREAL) LOW SUBHUMID

PETROPAVLOVSK (KAZAKHSTAN)

136 m

P= 413 54° 50'N 69° 9'E 11/11 y.
 T= 1.4° Ic= 37.2 Tp= 831 Tn= 664
 m= -21.1° M= -13.3° Itc= 20 Io= 3.9



TEMPERATE CONTINENTAL
 UPPER SUPRATEMPERATE (HEMIBOREAL) LOW SUBHUMID

WATER INDEX CARD PETROPAVLOVSK (KAZAKHSTAN)
 Altitude: 136 m. Latitude: 54° 50'N

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jan.	-17.2	0	13	13	76	0	0	0	0	*
Feb.	-17.0	0	24	24	100	0	0	0	0	*
Mar.	-8.6	0	17	0	100	0	0	17	9	*
Apr.	3.6	23	21	-2	98	23	0	0	4	-0.1
May.	12.8	93	38	-55	43	93	0	0	2	-0.5
Jun.	17.0	125	57	-43	0	100	25	0	1	-0.5
Jul.	20.0	148	66	0	0	66	82	0	1	-0.5
Aug.	16.7	110	70	0	0	70	40	0	0	-0.3
Sep.	11.1	62	34	0	0	34	29	0	0	-0.4
Oct.	1.9	10	36	26	26	10	0	0	0	2.6
Nov.	-7.8	0	25	25	51	0	0	0	0	*
Dec.	-15.8	0	12	12	64	0	0	0	0	*
Year	1.4	572	413	*	*	396	177	18	18	*

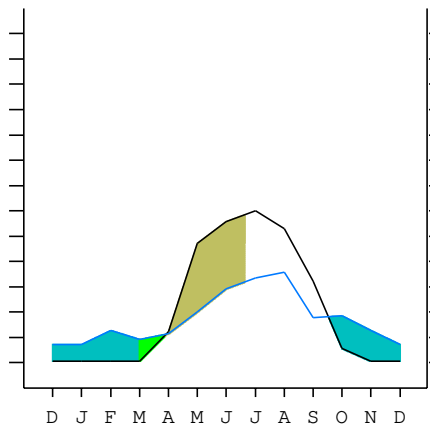
R = Reserve VR = Variation of the reserve RE = Real evapotranspiration
 DR = Drainage HC = Humidity coefficient DF = Deficit SP = Superavit

PETROPAVLOVSK (KAZAKHSTAN)

54°50'N 69°9'E 136 m 11/11 y.

T= 1.4 Ic= 37.2 TEMPERATE CONTINENTAL
 m= -21.1 Tp= 831 UPPER SUPRATEMPERATE (HEMIBOREAL)
 M= -13.3 Tn= 664 LOW SUBHUMID
 M' = 37.2 Itc= 20
 m' = -41.1 Io= 3.9
 P= 413 mm ———
 PE= 572 mm ———

Imbibing	16 Sep.
Saturation	30 Feb.
Reserve Use	27 Mar.
Deficit	19 Jun.



PETROPAVLOVSK (KAZAKHSTAN)

Latitude: 54°50'N Longitude: 69°9'E Altitude: 136 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [C3b]
 + Type: C. Continental
 + Subtype: 3. Eucontinental
 + Variant: b. High
 Thermic types [B2.C7]
 + Latitudinal zone: B. Temperate
 + Latitudinal belt: 2. Low subtemperate
 + Thermic type: C. Cold
 + Thermic subtype: 7. Cold
 Bioclimatic types [C2.4a.6b]
 + Macrobioclimate: C. TEMPERATE
 + Bioclimate: 2. CONTINENTAL
 + Bioclimatic variant ..:
 + Thermic type.....: 4. SUPRATEMPERATE (HEMIBOREAL)
 + Thermic subtype.....: a. UPPER
 + Ombrothermic type ...: 6. SUBHUMID
 + Ombrothermic subtype : b. LOW
 Bioclimatic Classification: Teoc.Ste.Shu

PETROPAVLOVSK (KAZAKHSTAN)

Latitude: 54°50'N Longitude: 69°9'E Altitude: 136 m

PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 286
 Coldest semester of the year.....(Psw): 127
 Warmest four months period of the year.....(Pcm1): 231
 Following warmest four months period.....(Pcm2): 107
 Positive precipitation dryest 3 months.....(Ppd): 0
 Positive precipitation dryest 2 months.....(Ppd2): 0
 Positive precipitation dryest 1 month.....(Ppd1): 0
 Positive precipitation warmest 3 months.....(Pps): 193
 Positive precipitation warmest 2 months.....(Pps2): 123
 Positive precipitation warmest 1 month.....(Pps1): 66
 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	49	76	193	94

Seasonal rainfall rhythms: S > F > P > W

PETROPAVLOVSK (KAZAKHSTAN)

Latitude: 54°50'N Longitude: 69°9'E Altitude: 136 m

TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 20.0
 Average coldest month [T].....(Tmin): -17.2
 Maximum temp. warmest month [M].....(Tmmax): 25.6
 Minimum temp. coldest month [m].....(Tmmin): -22.2
 Absolute Max.temp. warmest month [M'].....(Tamax): 37.2
 Absolute Min.temp. coldest month [m'].....(Tamin): -41.1
 First warmest contrasted month [M].....(Tcmax): 23.3 (6)
 First coldest contrasted month [m].....(Tcmin): 10.6 (6)
 Estival temperature.....(Ts): 536
 Positive temperature dryest 3 months.....(Tpd): 0
 Positive temperature dryest 2 months.....(Tpd2): 0
 Positive temperature dryest 1 month.....(Tpd1): 0
 Positive temperature warmest 3 months.....(Tps): 536
 Positive temperature warmest 2 months.....(Tps2): 370
 Positive temperature warmest 1 month.....(Tps1): 200
 Positive temperature coldest 3 months.....(Tpw): 0
 Positive temperature coldest 2 months.....(Tpw2): 0
 Positive temperature coldest 1 month.....(Tpw1): 0

PETROPAVLOVSK (KAZAKHSTAN)

Latitude: 54°50'N Longitude: 69°9'E Altitude: 136 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	o			
Ultragelid...[M' <=0] (Pf)	o											
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				

PETROPAVLOVSK (KAZAKHSTAN)

Latitude: 54°50'N Longitude: 69°9'E Altitude: 136 m

OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 1.38
 Mediterranean index of July.[PE/P].....(Im1): 2.25
 Mediterranean index of July & August.....(Im2): 1.90
 Mediterranean index of June, July & August....(Im3): 1.99

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	*	*	*	*	208	381	574	658	701	338	361	*
Tp	*	*	*	*	36	128	170	200	167	111	19	*
Io (Iom)	*	*	*	*	5.76	2.98	3.39	3.29	4.21	3.04	18.6	*
Seasons	Winter			Spring			Summer			Autumn		
Pp(x10)/Tp	*/*			*/*			1933 / 536			*/*		
Io (Iot)	*			*			3.605			*		
Semesters	December-May						June-November					
Pp(x10)/Tp	*/*						*/*					
Io (Iosm)	*						*					

PETROPAVLOVSK (KAZAKHSTAN)

Latitude: 54°50'N Longitude: 69°9'E Altitude: 136 m

Aridity Value Index (AVI)

[10xPP/TP=IO]: 3221/831=3.88 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	*	*	*	*	208	381	574	658	701	338	361	*
Tp [T*10]	*	*	*	*	36	128	170	200	167	111	19	*
Iom [Pp/Tp]	!!	!!	!!	!!	576	298	339	329	421	304	\$\$!!
Avm [200-Iom]	***	***	***	***	***	***	***	***	***	***	***	***
Seasons	Winter			Spring			Summer			Autumn		
Pp / Tp	* / *			* / *			1933 / 536			* / *		
Iot [Pp/Tp]	**			**			360			**		
Avs E[Avm<200]	***			***			***			***		

PETROPAVLOVSK (KAZAKHSTAN)

Latitude: 54°50'N Longitude: 69°9'E Altitude: 136 m

BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin]	(Sp): 37.22
CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4]	57.00
CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14]	55.91
+ Subcontinental (40<CI<60)	
CI of Currey (1974) [CI=Sp/(1+Lat/3)]	1.93
+ Continental (1.7<CI<2.3)	
Rainfall Index of Lang (1925) [R=P/T]	297.52
+ Humid (R>160)	
Aridity Index of Martonne (1926) [Ia=P/(T+10)]	36.29
+ Humid (60>Ia>30)	
I of Emberger (1930) [Q=100*P/(Tmax ² -Tmin ²)]	258.98
+ Humid (Q>90)	
I of Dantin & Revenga (1940) [DR=100*T/P]	0.34
+ Humid (2>DR>0)	
Aridity Index of UNEP [I=P/PE]	0.72
+ Humid (I>0.65)	
Potential Erosion I of Fournier (1960) [K=Pi ² /P]	11.89
+ Very low (K<60)	

PETROPAVLOVSK (KAZAKHSTAN)

Latitude: 54°50'N Longitude: 69°9'E Altitude: 136 m

BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)
 + Climate

- + Climate
- + Region
- + Thermic type: 7. Hipermicrothermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.09	0.19	0.13	0.12	0.17	0.24	0.26	0.31	0.16	0.24	0.20	0.09
T-E ratio	0.00	0.00	0.00	1.62	5.75	7.63	9.00	7.50	5.00	0.87	0.00	0.00
Precipitation-effectiveness: 22.10						Temperature-efficiency						37.38
Moisture Index [MI=100*(P-PE)/PE]												-27.79
+ C1.Subhumid dry (-33.3<MI<0)												
Index of dryness [DI=100*d/PE]												30.84
+ Moderate deficit (16.7<DI<33.3)												
Index of humidity [HI=100*s/PE]												3.06
+ No surplus (0<HI<10)												
Potential Evapotranspiration PE												572.32
+ First mesothermic (570<PE<712)												

