

# Phytosociological Research Center

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## Worldwide Bioclimatic Classification System

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(Adapted to Synoptical Table 30/08/2017)

VISHAKHAPATMAM (INDIA)

Altitude: 38 m.

Latitude: 17°42'N Longitude: 83°18'E

Temperature observation period.: 1935-1980 (46)

Rainfall observation period....: 1940-1980 (41)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPI
Jan.	23.30	27.20	19.40	32.20	14.40	10.0	74.52
Feb.	25.00	28.30	21.70	36.70	16.10	23.0	92.94
Mar.	27.20	30.60	23.90	36.10	18.30	13.0	145.34
Apr.	28.90	32.20	25.60	37.20	18.30	18.0	162.45
May.	30.30	33.30	27.20	43.30	20.00	51.0	185.82
Jun.	30.30	33.30	27.20	43.90	21.10	104.0	182.51
Jul.	28.90	31.70	26.10	38.30	21.70	112.0	174.82
Aug.	28.90	31.70	26.10	37.20	21.10	132.0	170.18
Sep.	28.30	31.10	25.60	37.80	22.20	165.0	152.91
Oct.	28.10	31.10	25.00	36.10	20.60	198.0	148.31
Nov.	25.60	28.90	22.20	32.80	15.00	119.0	106.86
Dec.	23.60	27.20	20.00	31.10	15.00	15.0	77.67
Year	27.37	30.55	24.17	36.89	18.65	960	1674.3

### BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	740
Compensated thermicity index.....(Itc):	740
Simple continentality index.....(Ic):	7.0
Diurnality index.....(Id):	7.8
Annual ombrothermic index.....(Io):	2.92
Monthly dry ombrothermic index.....(Iod1):	0.43
Bimonthly dry ombrothermic index.....(Iod2):	0.68
Three monthly dry ombrothermic index.....(Iod3):	0.61
Four monthly dry ombrothermic index.....(Iod4):	0.62
Annual ombro-evaporation index.....(Ioe):	1.54
Annual positive temperature.....(Tp):	3284
Annual negative temperature.....(Tn):	0
Dry station temperature.....(Td):	755
Positive precipitation.....(Pp):	960

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

Latitudinal Belt...: Eutropical

Continentalty.....: Hyperoceanic - Low Euhyperoceanic

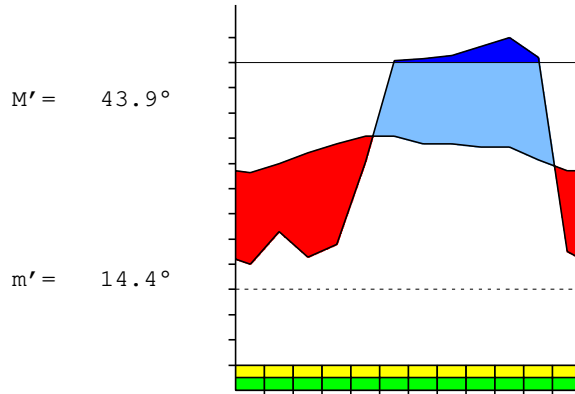
Bioclimate(Variant): TROPICAL XERIC (PLUVISEROTIN, DRY)

Bioclimatic Belt...: UPPER INFRATROPICAL UPPER DRY

VISHAKHAPATMAM (INDIA)

38 m

P= 960 17° 42'N 83° 18'E 46/41 y.  
 T= 27.4° Ic= 7.0 Tp= 3284 Tn= 0  
 m= 19.4° M= 27.2° Itc= 740 Io= 2.9



TROPICAL XERIC (PLUVISEROTIN)  
 UPPER INFRATROPICAL UPPER DRY

WATER INDEX CARD VISHAKHAPATMAM (INDIA)  
 Altitude: 38 m. Latitude: 17° 42'N

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jan.	23.3	75	10	-11	0	21	53	0	0	-0.8
Feb.	25.0	93	23	0	0	23	70	0	0	-0.7
Mar.	27.2	145	13	0	0	13	132	0	0	-0.9
Apr.	28.9	162	18	0	0	18	144	0	0	-0.8
May.	30.3	186	51	0	0	51	135	0	0	-0.7
Jun.	30.3	183	104	0	0	104	79	0	0	-0.4
Jul.	28.9	175	112	0	0	112	63	0	0	-0.3
Aug.	28.9	170	132	0	0	132	38	0	0	-0.2
Sep.	28.3	153	165	12	12	153	0	0	0	0.0
Oct.	28.1	148	198	50	62	148	0	0	0	0.3
Nov.	25.6	107	119	12	74	107	0	0	0	0.1
Dec.	23.6	78	15	-63	11	78	0	0	0	-0.8
Year	27.4	1674	960	*	*	960	714	0	0	*

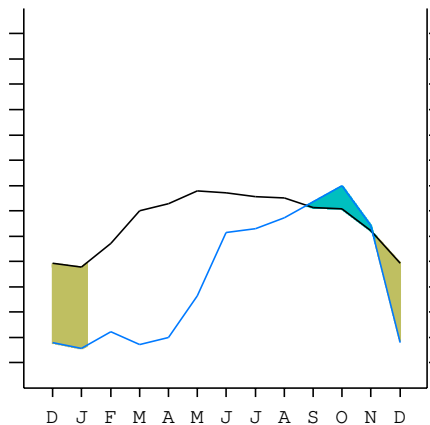
R = Reserve VR = Variation of the reserve RE = Real evapotranspiration  
 DR = Drainage HC = Humidity coefficient DF = Deficit SP = Superavit

VISHAKHAPATMAM (INDIA)

17°42'N 83°18'E 38 m 46/41 y.

T= 27.4 Ic= 7.0 TROPICAL XERIC (PLUVISEROTIN)  
 m= 19.4 Tp= 3284 UPPER INFRATROPICAL  
 M= 27.2 Tn= 0 UPPER DRY  
 M' = 43.9 Itc= 740  
 m' = 14.4 Io= 2.9  
 P= 960 mm ———  
 PE= 1674 mm ———

Imbibing	23 Aug.
Saturation	5 Nov.
Reserve Use	6 Jan.
Deficit	



VISHAKHAPATMAM (INDIA)

Latitude: 17°42'N Longitude: 83°18'E Altitude: 38 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [A2b]  
 + Type .....: A. Hyperoceanic  
 + Subtype .....: 2. Euhyperoceanic  
 + Variant .....: b. Low  
 Thermic types [A2.A1]  
 + Latitudinal zone ....: A. Warm  
 + Latitudinal belt ....: 2. Eutropical  
 + Thermic type .....: A. Warm  
 + Thermic subtype .....: 1. Torrid  
 Bioclimatic types [A3e.1a.5a]  
 + Macrobioclimate .....: A. TROPICAL  
 + Bioclimate .....: 3. XERIC  
 + Bioclimatic variant .: e. PLUVISEROTIN, DRY  
 + Thermic type.....: 1. INFRATROPICAL  
 + Thermic subtype.....: a. UPPER  
 + Ombrothermic type ...: 5. DRY  
 + Ombrothermic subtype : a. UPPER  
 Bioclimatic Classification .....: Trxe (Pse).Itr.Dry

VISHAKHAPATMAM (INDIA)

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 582  
 Coldest semester of the year.....(Psw): 378  
 Warmest four months period of the year.....(Pcm1): 285  
 Following warmest four months period.....(Pcm2): 614  
 Positive precipitation dryest 3 months.....(Ppd): 46  
 Positive precipitation dryest 2 months.....(Ppd2): 25  
 Positive precipitation dryest 1 month.....(Ppd1): 10  
 Positive precipitation warmest 3 months.....(Pps): 173  
 Positive precipitation warmest 2 months.....(Pps2): 155  
 Positive precipitation warmest 1 month.....(Pps1): 51  
 Positive precipitation coldest 3 months.....(Ppw): 48  
 Positive precipitation coldest 2 months.....(Ppw2): 25  
 Positive precipitation coldest 1 month.....(Ppw1): 10

Seasons	Dec+Jan+Feb Ttr1-1	Mar+Apr+May Ttr2-2	Jun+Jul+Aug Ttr3-3	Sep+Oct+Nov Ttr4-4
Rainfall	48	82	348	482

Tropical rainfall rhythms: 4 > 3 > 2 > 1

VISHAKHAPATMAM (INDIA)

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 30.3  
 Average coldest month [T].....(Tmin): 23.3  
 Maximum temp. warmest month [M].....(Tmmax): 33.3  
 Minimum temp. coldest month [m].....(Tmmin): 19.4  
 Absolute Max.temp. warmest month [M'].....(Tamax): 43.9  
 Absolute Min.temp. coldest month [m'].....(Tamin): 14.4  
 First warmest contrasted month [M].....(Tcmax): 27.2 (1)  
 First coldest contrasted month [m].....(Tcmin): 19.4 (1)  
 Dry station temperature.....(Td): 755  
 Positive temperature dryest 3 months.....(Tpd): 755  
 Positive temperature dryest 2 months.....(Tpd2): 469  
 Positive temperature dryest 1 month.....(Tpd1): 233  
 Positive temperature warmest 3 months.....(Tps): 895  
 Positive temperature warmest 2 months.....(Tps2): 606  
 Positive temperature warmest 1 month.....(Tps1): 303  
 Positive temperature coldest 3 months.....(Tpw): 719  
 Positive temperature coldest 2 months.....(Tpw2): 469  
 Positive temperature coldest 1 month.....(Tpw1): 233

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

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OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 1.74  
 Mediterranean index of July.[PE/P].....(Im1): No  
 Mediterranean index of July & August.....(Im2): No  
 Mediterranean index of June, July & August....(Im3): No

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	150	100	230	130	180	510	1040	1120	1320	1650	1980	1190
Tp	236	233	250	272	289	303	303	289	289	283	281	256
Io (Iom)	0.64	0.43	0.92	0.48	0.62	1.68	3.43	3.88	4.57	5.83	7.05	4.65
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp(x10)/Tp	480 / 719			820 / 864			3480 / 881			4820 / 820		
Io (Iot)	0.668			0.949			3.950			5.878		
Semesters	December-May						June-November					
Pp(x10)/Tp	1300 / 1583						8300 / 1701					
Io (Iosm)	0.821						4.879					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 9600/3284=2.92 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	150	100	230	130	180	510	1040	1120	1320	1650	1980	1190
Tp [T*10]	236	233	250	272	289	303	303	289	289	283	281	256
Iom [Pp/Tp]	64	43	92	48	62	168	343	388	457	583	705	465
Avm [200-Iom]	136	157	108	152	138	32	***	***	***	***	***	***
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp / Tp	480 / 719			820 / 864			3480 / 881			4820 / 820		
Iot [Pp/Tp]	67			95			395			588		
Avs E[Avm<200]	402			322			***			***		
Strong lower arid [2]							Weak lower arid [3]					
Weak upper arid [2]							Strong upper semiarid [1]					

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....	(Sp):	7.00
CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4] .....		18.74
CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14] .....		11.60
+ Hyperoceanic (-20<CI<20)		
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] .....		35.08
+ Steppic (40>R>0)		
Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....		25.69
+ Subhumid (30>Ia>20)		
I of Emberger (1930) [Q=100*P/(Tmax <sup>2</sup> -Tmin <sup>2</sup> )] .....		131.05
+ Humid (Q>90)		
I of Dantin & Revenga (1940) [DR=100*T/P] .....		2.85
+ Semiarid (3>DR>2)		
Aridity Index of UNEP [I=P/PE] .....		0.57
+ Subhumid - dry (0.65>I>0.5)		
Potential Erosion I of Fournier (1960) [K=Pi <sup>2</sup> /P] .....		40.84
+ Very low (K<60)		

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BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)  
 + Climate .....

- + Climate .....
- + Region .....
- + Thermic type: 1. Megathermic

Thornthwaite (1948)													
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
P-E ratio	0.03	0.07	0.04	0.05	0.16	0.34	0.38	0.46	0.60	0.74	0.44	0.05	
T-E ratio	10.48	11.25	12.24	13.00	13.63	13.63	13.00	13.00	12.73	12.65	11.52	10.62	
Precipitation-effectiveness:	33.54					Temperature-efficiency .....							147.78
Moisture Index [MI=100*(P-PE)/PE] .....	-42.66												
+ D.Semiarid (-66.7<MI<-33.3)													
Index of dryness [DI=100*d/PE] .....	42.66												
+ Strong deficit (33.3<DI)													
Index of humidity [HI=100*s/PE] .....	0.00												
+ No surplus (0<HI<10)													
Potential Evapotranspiration PE .....	1674.32												
+ Megathermic (PE>1440)													

