



Government of Pakistan
Pakistan Meteorological Department
Pakistan's Monthly Climate Summary
September 2023

In brief

- National rainfall for the month of September 2023 was close to the average (-7%).
- The wettest day of the month in the country was September 19th when Lahore (Punjab) recorded 122.0 mm of rainfall, making it the wettest place with a monthly total rainfall of 307.0 mm.
- The national mean monthly temperature of September 2023 for Pakistan as a whole was 29.10 °C, which was **1.12 °C warmer** than the 27.98 °C average and ranks as the 4th warmest mean temperature for the month in the past 63 years, with the record being 29.79 °C in 2019.
- The daytime (maximum) temperature at the country-level was 35.50 °C, which is **0.98 °C warmer** than the country-wide average of 34.52 °C and stands as the 5th warmest average daytime maximum temperature for the month in the past 63 years, with the record being 36.22°C in 2019.
- The nighttime (minimum) temperature at country level was 22.68 °C, which is **1.66 °C warmer** than the country-wide average of 21.02 °C and ranks as the 4th warmest average nighttime minimum temperature for the month in the past 63 years, with the record being 23.30 °C in 2019.
- In AJK, the average daytime temperature was 24.32°C, being **+1.89 °C** above average. This is the second highest observed in the past 63 years, with the record being 24.43°C in 2019.
- The hottest day of the month was observed in Turbat (Balochistan) when it recorded a temperature of 45.5 °C on September 21, 2023, while Sibbi (Balochistan) was the **warmest** place with a mean monthly maximum temperature of 40.8 °C.
- The **coldest** temperature of the month, 2.5°C, was recorded in Kalam (KP) on September 30, 2023. Coincidentally, the same station was the **coolest** place with a mean monthly minimum temperature of 8.3 °C.
- The Indian Ocean Dipole (IOD) index is inclined to positive phase.
- Central and eastern Pacific Sea surface temperatures (SSTs) consistently exceed El Niño thresholds, turning into a full-blown El Niño.

Table-1: National Weather Extremes during September 2023

Hottest day	45.5 °C	at Turbat (Balochistan) on the 21st
Coldest day	14.0 °C	at Babusar (GB) on the 29th
Coldest night	2.5 °C	at Kalam (KP) on the 30th
Warmest night	30.8 °C	at Multan Airport (Punjab) on the 13th & 15th
Wettest day	122.0 mm	at Lahore Airport (Punjab) on the 19th
Wettest month	307.0 mm	at Lahore Airport (Punjab)

Synoptic Summary

A carryover westerly trough from the preceding month of August continued to prevail over Upper Khyber Pakhtunkhwa (KP), Gilgit-Baltistan (GB), Kashmir and northern Punjab for most of the month. The heat low remained centred around North/Northwest Balochistan and adjacent areas from 1st – 19th September. Monsoon currents penetrated into southern and upper parts of the country from 20th – 24th September, resulting in widespread rain/thundershowers in KP, GB, Kashmir, Punjab and southern Sindh with a few occurrences also in northeast Balochistan during that period.

The monsoon withdrew from the country from 26 September followed by the dry-continental air entrance in Balochistan and southern Sindh that caused a heatwave like conditions in Karachi and other southern districts of Sindh during 28-30 September.

Table-2: Significant wind speeds recorded during the September-2023

Date	Station	Max Wind Knots	Date	Station	Max Wind Knots	Date	Station	Max Wind Knots	Date	Station	Max Wind Knots
02/2023	Peshawar AP	35	29/2023	Rawalpindi	32	05/2023	Islamabad ZP	45	22/2023	Jouharabad	37
04/2023	Peshawar AP	32	09/2023	Islamabad AP	33	22/2023	Islamabad ZP	35	17/2023	Lahore AP	40
12/2023	Cherat	30	29/2023	Islamabad AP	30	04/2023	Jhelum	30	22/2023	Lahore AP	50
04/2023	Rawalpindi	38	29/2023	Islamabad AP	30	04/2023	Sialkot AP	30			
29/2023	Rawalpindi	38	04/2023	Mangla	35	22/2023	D-I-Khan AP	40			

Table-3: New Weather (rain & temperature) Records Set in July 2023

S No	Stations	Weather Parameters	New Record		Old Record		No of years examined.
			Value	Date	Value	Date	
1	Bannu	Hottest day temperature (°C)	41.5	15/2023	41.0	14/2018	25
2	Garhi Dupatta	Hottest day temperature (°C)	38.5	02/2023	38.0	(03)/2019	63
3	Islamabad Zero Point	Hottest day temperature (°C)	37.2	04&15/2023	37.2	13/2019	41
4	Mithi	Hottest day temperature (°C)	42.5	07&08/2023	42.0	22/2018	20
5	Quetta City	Hottest day temperature (°C)	38.5	12/2023	38.0	09/2021	27

Rainfall: near to average in the country as a whole

Climatologically, the September rainfall contribution to the national annual total and monsoon (JAS) is 7.2% & 15.2%, respectively. During the month, Pakistan experienced 4/5 light to moderate rainfall spells. The area-averaged daily rainfall is shown in Fig.1. September 2023 rainfall was near average, -7%, for Pakistan as a whole. On regional scale GB with 9.80mm (+1%) and Punjab with 37.20mm (+07%) observed near-average rainfall. Balochistan with 3.50 mm (-43%), AJK with 38.90 (-40%) & KP with 35.50mm (-23%) recorded below average rainfall. Sindh with 25.00 (+26%) was the only region having above average rainfall (Table-4).

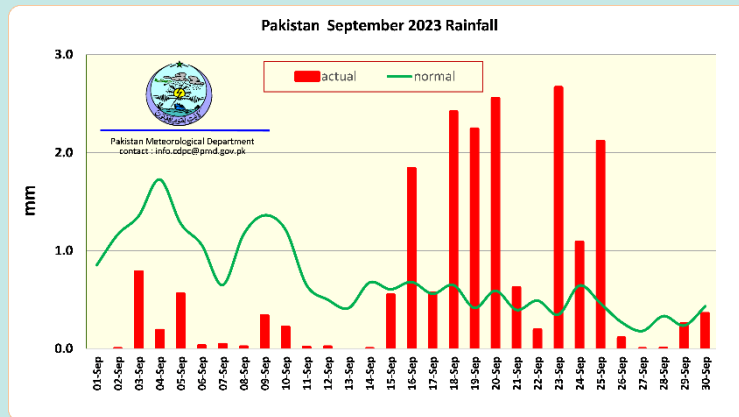


Fig1: Daily Area Weighted Rainfall

The wettest day of the month in the country was 19th September when Lahore (Punjab) recorded 122.0 mm of rainfall. Coincidentally, the same station was the wettest place with a monthly total rainfall of 307.0 mm (Table-1).

Table-4: September 2023 Area-Weighted Rainfall

Region	Rank (of 63y)	Normal (mm)	Average (mm)	Departure (percent)	Comment
Pakistan	38	21.40	19.80	-7	----
Azad Jammu & Kashmir	13	64.90	38.90	-40	----
Balochistan	29	6.20	3.50	-43	----
Gilgit Baltistan	42	9.70	9.80	1	----
Khyber Pakhtunkhwa	19	46.00	35.50	-23	----
Punjab	36	34.70	37.20	7	----
Sindh	45	19.90	25.00	26	----

[RANK RANGES FROM 1 (LOWEST) TO 63 (HIGHEST) IN TERMS OF YEARS FROM 1961]

September 2023 Rainfall maps

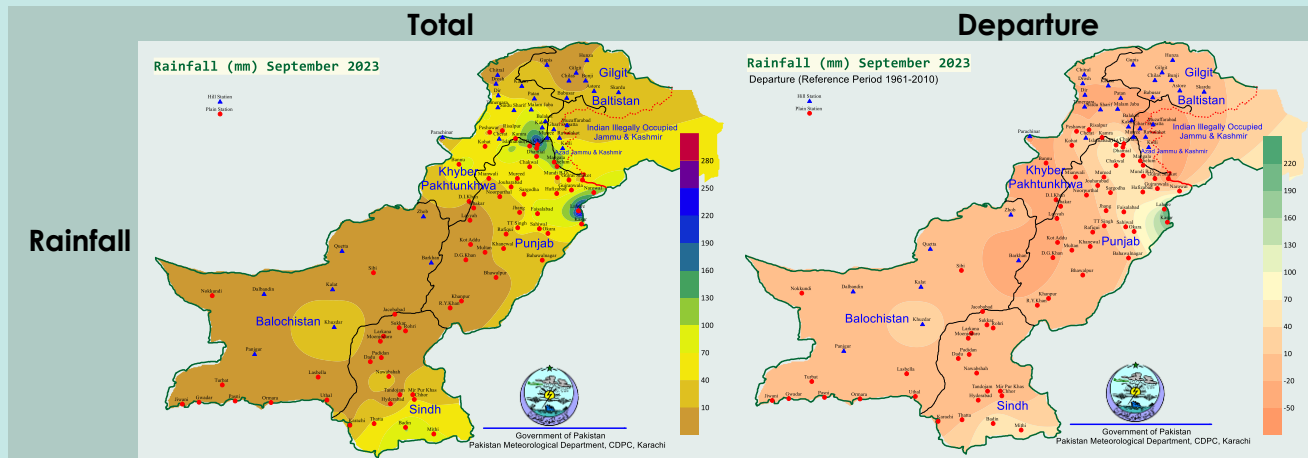


Fig. 2. September spatial rainfall distribution and departure from normal

The other significant rainfalls were recorded at Islamabad (Zero Point) 233.5 mm, Rawalpindi 179.3 mm, Lahore City 174.8 mm, Jhelum 130.0 mm, Narowal 121.9 mm, Attock 108.2 mm, Mangla 108.0 mm, Islamabad Airport 104.3 mm, Badin 102.2 mm, Murree 100.5 mm, Kakul 94.8 mm and Faisalabad Airport 93.0 mm. The stations; Kot Addu, Layyah, Rahim Yar Khan, Hyderabad, Jacobabad, Larkana, Rohri, Sukkur, M.Jo.Daro, Khairpur, Dalbandin, Gwadar, Jiwani, Kalat, Nokkundi, Panjgur, Pasni, Quetta, Ormara and Zhob remained absolutely dry with no rain during the month. The stations; Khanpur, Multan City, Padidan, Tando Jam and Sibbi recorded only traces of rainfall during the month.

Table 4: Temperatures: Warmer than average in the country.

Area Average Temperatures (°C) statistics in September 2023						
Regions	Maximum Temperature		Minimum Temperature		Mean Temperature	
	Actual	Anomaly	Actual	Anomaly	Actual	Anomaly
Pakistan	35.50	0.98	22.68	1.66	29.10	1.12
Azad Jammu & Kashmir	30.78	1.98	17.84	1.77	24.32	1.89
Balochistan	36.07	1.07	21.93	1.79	29.01	1.10
Gilgit-Baltistan	29.97	0.81	14.69	0.53	22.38	0.85
Khyber Pakhtunkhwa	33.41	0.96	20.57	1.39	27.02	1.21
Punjab	36.62	0.68	25.65	2.14	31.14	1.13
Sindh	37.08	0.88	25.92	1.44	31.50	1.06

September 2023 was **1.12 °C, warmer** than average with national mean monthly temperature being 29.10°C against the average of 27.98 °C and stands 4th warmest mean temperature during past 63 years (the record is 29.79 in 2019). So was the situation in all regions; AJK with 24.32°C (**+1.89°C**) observed the 2nd highest monthly mean (the record being 24.43°C in 2019), KP with 27.02 °C (**+1.21°C**) observed the 5th highest mean (the record being 27.61°C in 1961), Punjab with 31.14°C (**+1.13°C**) observed the 4th highest mean (the record being 31.57°C in 1961), Sindh with 31.50 °C (**+1.06°C**) observed the 6th highest mean (the record being 32.39°C in 2021), Balochistan with 29.01°C (**+1.10 °C**) and GB with 22.38 (**+0.85 °C**) all exhibited warmer than average temperatures.

The mean monthly maximum (daytime) temperature (35.50 °C) recorded at country-level was also **+0.98°C warmer** than average of 34.52°C (Table-4, Fig. 3, upper panel) and stands

5th warmest average day maximum temperature in the month during past 63 years (the record is 36.22 in 2019). Similarly, the country-level night (minimum) temperature of 22.68 °C was **+1.66°C warmer** than average of 21.02°C and stands as the 4th warmest average night minimum temperature in the month during past 63 years (the record is 23.30 in 2019) (Table-4, Fig. 3, middle panel). The mean temperature anomalies ranged from -1.5 to +4.1°C while the mean maximum temperature anomalies were from -0.8 to +3.7°C in the country, being considerably higher in AJK. The hottest day of the month was recorded at Turbat (Balochistan) when it recorded a temperature of 45.5 °C on 21st September (Table-1). Sibbi, with a mean monthly maximum temperature of 40.8°C, was the warmest place during the month. Kalam (KP) recorded the month's **coldest** night temperature of 2.5°C on 30th September (Table-1), which also has been the **coolest** place with 8.3°C average minimum temperature.

September 2023 Temperature maps

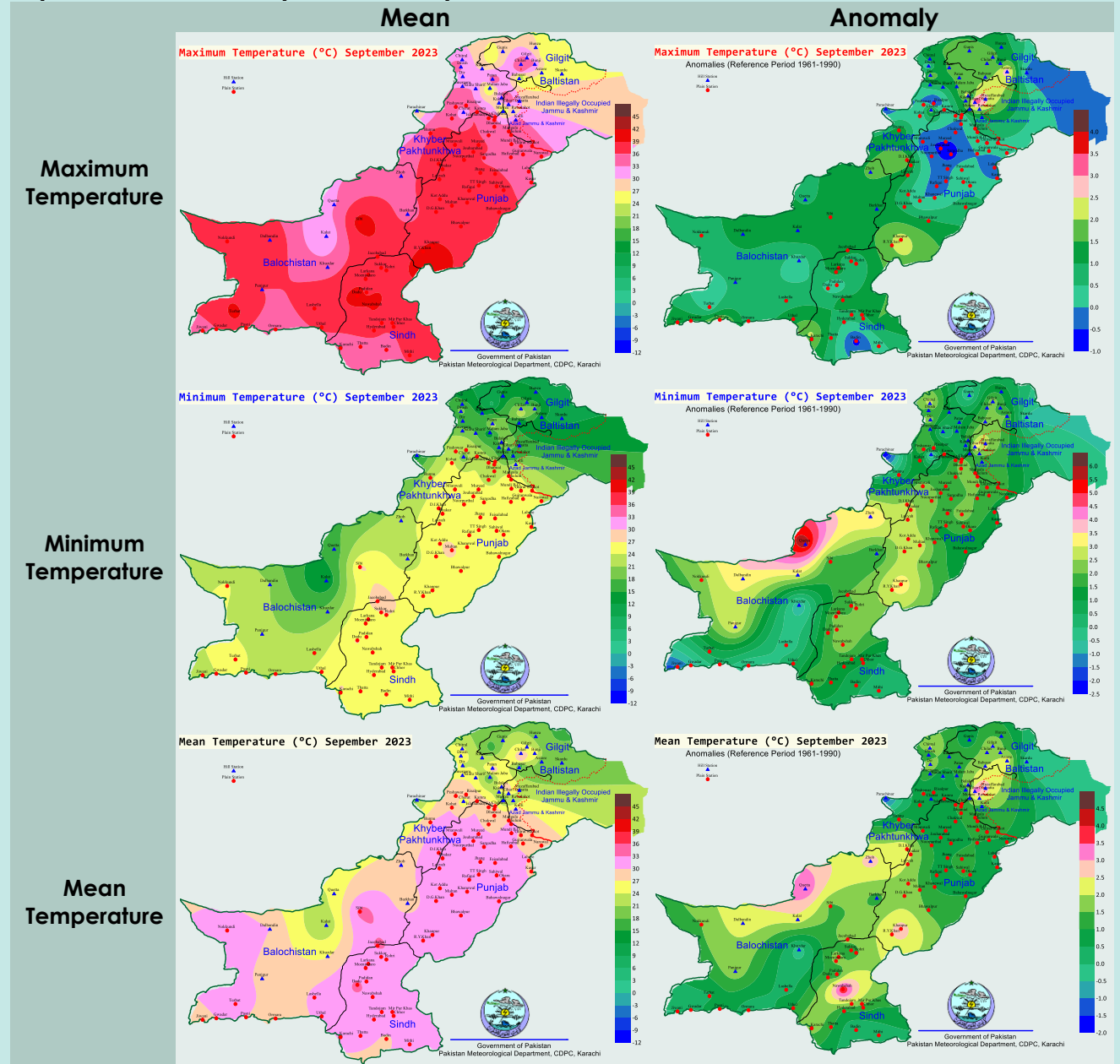


Fig. 3. September-23 Temperatures (Mean, Maximum and Minimum) and their anomalies

Table 5: September 2023 Monthly Averages & Normals

Station	Pressure (mb)		Temperature (°C)			Vapour (mb)	Precipitation	
	Station Level	Sea Level	Mean	Maximum	Minimum	Pressure	Total (mm)	Days
Drosh	849.2	1455.8	26.4	33.0	19.7	14.5	8.1	3
	850.3	1466.6	25.6	33.1	18.2	11.4	21.8	4.8
Peshawar	968.2	1004.5	30.0	36.0	24.0	27.7	33.2	3
	963.7	1003.3	29.0	35.2	22.7	24.0	22.2	4.4
Parachinar	825.4	1472.7	19.9	26.7	13.1	15.1	2.0	1
	825.6	1473.5	20.7	27.2	14.3	13.1	55.4	8.4
Rawalpindi	949.4	1005.0	28.2	33.5	22.9	23.8	179.3	9
	948.3	1004.3	26.6	33.5	20.7	23.1	113.2	8.7
Sargodha	983.0	1003.3	31.5	36.9	26.0	29.9	70.8	4
	983.3	1004.1	30.3	36.3	24.2	26.2	27.7	4.3
Jhelum	977.5	1003.4	30.3	35.6	25.0	30.7	130.0	5
	978.0	1004.0	28.9	34.7	23.1	26.3	74.5	7.1
Sialkot	976.0	1004.3	29.2	34.0	24.4	29.8	32.5	4
	976.1	1004.4	27.9	33.2	22.6	27.4	90.7	6.8
Zhob	854.3	1449.8	28.6	34.5	22.6	15.4	0.0	0
	854.6	1451.4	26.1	33.2	19.1	12.9	11.5	1.2
D.I.Khan	983.8	1002.7	32.5	38.5	26.4	31.0	6.0	1
	983.9	1003.0	30.1	36.5	23.6	26.4	20.8	2.1
Lahore	980.8	1004.6	30.2	34.6	25.8	29.7	174.8	5
	980.0	1003.8	29.8	35.0	24.6	26.4	65.1	6.4
Quetta	840.3	1487.9	24.6	32.3	16.8	6.4	0.0	0
	838.5	1469.6	21.6	31.6	11.7	9.0	2.5	0.4
Multan	989.2	1002.8	32.5	37.2	27.8	28.6	3.0	1
	989.8	1003.4	30.9	36.9	24.9	26.4	24.9	1.7
Barkhan	885.7	1459.6	28.3	34.7	21.8	18.7	2.0	1
	886.4	1465.7	27.1	33.6	20.6	16.5	44.5	3
Nokkundi	928.4	1001.1	31.5	38.8	24.2	4.6	0.0	0
	929.4	1002.0	30.1	38.6	22.2	9.4	0.0	0
Dalbandin	912.6	1475.5	30.0	39.0	21.0	6.8	0.0	0
	912.6	1474.4	28.0	37.2	16.5	6.3	0.0	0.1
Jacobabad	996.8	1003.0	33.1	38.3	27.9	32.3	0.0	0
	996.3	1003.2	31.4	36.8	26.0	28.2	11.0	0.4
Khanpur	993.0	1002.9	32.9	39.3	26.5	32.0	0.0	0
	993.4	1003.3	29.8	36.7	22.9	26.7	14.6	1.2
Panjgur	898.6	1469.7	29.1	36.0	22.1	11.9	0.0	0
	899.7	1476.7	27.4	35.4	19.3	8.3	2.5	0.4
Khuzdar	873.2	1467.3	26.7	34.2	19.1	8.0	36.5	3
	872.5	1451.4	26.7	34.2	20.0	6.1	7.9	1.5
Sh. Benazirabad	999.4	1002.7	33.0	39.7	26.3	30.3	12.0	1
	1000.3	1004.0	31.2	38.6	23.7	28.1	16.2	1
Jiwani	998.8	1005.2	27.8	33.1	22.5	28.5	0.0	0
	999.3	1005.7	27.8	31.5	24.3	28.2	0.3	0.1
Pasni	1004.3	1004.8	29.4	35.2	23.7	27.4	0.0	0
	1004.2	1004.8	27.4	32.6	23.6	27.5	1.2	0.2
Hyderabad	998.7	1003.5	32.0	37.3	26.5	27.7	0.0	0
	1000.6	1004.2	31.0	36.4	25.3	26.8	12.6	0.8
Chhor	1002.9	1003.6	30.8	37.2	24.4	31.4	32.0	3
	1003.8	996.9	29.8	36.0	23.7	27.3	37.3	1.4
Karachi	1002.0	1004.7	30.9	34.7	27.1	30.0	4.6	1
	1003.2	1005.9	29.1	32.8	25.4	27.8	10.2	0.8

Note: The first row against each station contains the actual values while second row for normal values

Table-6: September 2023 extreme values

STATION	Mean Temperature (°C)				Temperature (°C)				Highest (mm & knots)			
	Highest	Date	Lowest	Date	Highest	Date	Lowest	Date	Rain	Date	Wind Speed	Date
Drosh	31.2	13	16.8	30	38.2	13	10.3	30	5.8	30	14	1
Peshawar	33.2	14	23.5	29	38.6	9	17.6	30	18.0	25	6	18
Parachinar	22.0	1	18.3	24*	29.0	1	11.5	16*	2.0	17	4	3*
Rawalpindi	31.9	14	24.2	25*	36.6	8	17.4	30	72.0	16	38	29
Sargodha	34.9	8	25.9	25	41.3	8	20.5	25	27.2	18	6	16*
Jhelum	33.5	14	26.4	23	39.3	7	20.0	30	73.8	23	12	22*
Sialkot	31.8	1	26.9	30	37.0	7	20.3	30	12.0	10	8	15*
Zhob	31.5	2	22.5	30	38.0	10*	16.5	30	0.0	0	11	14*
D.I.Khan	34.8	1*	27.0	25	42.0	15	20.5	30	6.0	23	6	23*
Lahore	33.0	1	25.2	19	38.0	7	21.8	23	66.2	23	12	17
Quetta	29.0	1	17.3	30	36.5	1*	10.0	30	0.0	0	20	28*
Multan	35.4	13*	28.5	30	40.2	11	21.8	30	3.0	16	16	1*
Barkhan	31.0	11*	25.0	30	38.0	10*	18.5	30	2.0	17	6	5
Nokkundi	37.5	2	24.5	24	45.0	52	17.5	25	0.0	0	20	21
Dalbandin	36.3	1*	23.0	30	44.0	2*	13.5	30	0.0	0	8	20*
Jacobabad	35.3	10	31.0	30	41.5	10	25.0	30	0.0	0	4	1*
Khanpur	35.2	8	29.0	30	42.5	8	22.2	29*	0.0	0	8	1*
Panjgur	32.8	14	23.8	30	41.0	13*	17.5	30	0.0	0	22	22
Khuzdar	28.5	1	24.3	29*	36.0	1	15.0	29*	24.7	18	12	16
Sh.Benazirabad	35.5	9	31.0	30	43.4	9	24.0	2	12.0	21	18	2
Jiwani	30.3	29	26.5	15	38.5	29	20.0	27*	0.0	0	12	12
Pasni	32.0	21	28.0	1*	40.0	24	21.0	24	0.0	0	16	12
Hyderabad	34.6	8	30.0	3	41.5	29	24.4	26	0.0	0	26	2
Chhor	33.4	7	29.0	19	41.7	7	23.0	12*	15.0	20	12	2*
Karachi	33.6	28	28.6	4	40.6	30	24.6	26	4.6	21	14	10

* means value occurred multiple times

Note

Monthly Climate Summary is produced by Pakistan Meteorological Department, Climate Data Processing Centre, Karachi to provide the main features of weather events occurred in the country during the month. The summary contains detailed data information of 25 climate stations of Pakistan. The extremes & analysis is based on 110 numbers of stations. The information in the summary is based on real time data and/or electronic reports, therefore, the above results can be considered only preliminary. Climate Summaries are usually published in the first week of each month. Long term average for rainfall is for 1961-2010 (50 years) while normal period for temperature is 1961-1990 (30 years).

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