



Pakistan's Monthly Climate Summary OCTOBER, 2021

Overview

- Significant synoptic feature of the month was the formation of a Cyclonic Storm (CS), **SHAHEEN**, over the Northeast Arabian Sea,
- CS intensified further into a *Severe Cyclonic Storm (SCS)* by evening of 1st October.
- Under its influence fairly widespread heavy rainfall with very strong winds lashed the Makran coastal belt.
- October 2021 rainfall was 134.3% above average for Pakistan as a whole and stood fifth wettest month on record.
- Rainfall for the month was above average across much of the country, and largely above average for October in coastal area, Northern KP, AJK and upper Punjab.
- AJK (+109.4%), Balochistan (+261.3 %), GB (+83.3 %), Punjab (+216.2 %) and Sindh (+47.2 %) all experienced among tenth heaviest rainfall on record except KP (+64.7 %) where it was ranked thirteenth wettest.
- The wettest day of the month in the country was 18th October when PAF Nur Khan (Punjab) recorded 117.7 mm of rain.
- The national mean monthly temperature of October 2021 for Pakistan as a whole was 23.96 °C, being 0.60 °C warmer than monthly-average.
- The mean maximum (day) temperature at country-level was 31.54 °C, being 0.27 °C lower than average of 31.28 °C.
- The night (minimum) temperature was 16.63 °C, being 1.41 °C warmer than country-average of 15.22 °C.
- The hottest days of the month were at Sh. Benazirabad (Sindh) with 43.0 °C temperature on 8th & 9th October.
- The coldest night of the month was at Kalam (KP) when it recorded -2.0 °C temperature on 24th October.
- The negative Indian Ocean Dipole (IOD) event persisted in the month.
- El Nino-Southern Oscillation (ENSO) continued to be in neutral phase during October 2021.

National weather extremes during OCTOBER 2021

Hottest day	43.0 °C	at Sh. Benazirabad (Sindh) on the 8 th & 9 th
Coldest day	6.0 °C	at Babusar (KP) on the 17 th
Coldest night	-2.0 °C	at Kalam (KP) on the 24 th
Warmest night	28.8 °C	at Multan AirPort (Punjab) on the 1 st
Wettest day	117.7 mm	at Chaklala Airbase (Punjab) on the 18 th
Wettest month	257.8 mm	at Chaklala Airbase (Punjab)

Synoptic Summary

With the start of October 2021, the most significant synoptic situation observed was the formation of a Cyclonic Storm (CS), **SHAHEEN**, over the Northeast Arabian Sea, at a distance of about 280 km southwest of Karachi, owing to intensification of a deep depression which was actually caused by a low-pressure area having moved in from the Indian mainland. Moving in west-northwest direction, the system intensified further into a *Severe Cyclonic Storm (SCS)* by evening of 1st October. The SCS "**SHAHEEN**"

kept tracking west-northwestward till 3rd October afternoon and from thereon it recurved westward towards the Oman coast and ultimately crossed Oman north coast by midnight of 3rd October as a Severe Cyclonic Storm. Under its influence fairly widespread heavy rainfall with very strong winds lashed the Makran coastal belt with some scattered moderate rains reported from Karachi and other parts of lower Sindh. On the other hand, monsoon currents continued to penetrate in north/northeast of the country till 5th October owing to a southwest flow setup by the aforementioned cyclone and its predecessor depression which produced some heavy rainfall over there.

Monsoon withdrew from the country from 6th October 2021. Seasonal low however persisted over north Balochistan and adjoining areas till 10th October. Then 1st western disturbance approached the north Pakistan from 10th October, persisted for the following 3 days and yielded some healthy rains which made October monthly total rain in surplus followed by shallow troughing over north Pakistan (KP & GB) till end 2nd week. And during last week of the month dry continental air started dominating the country.

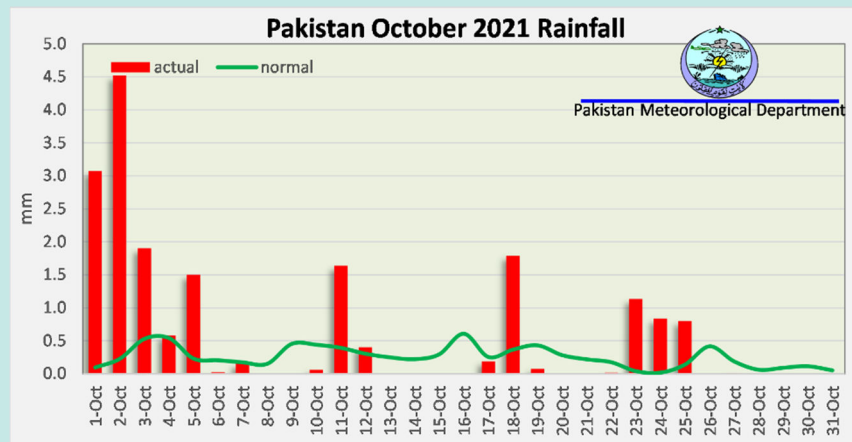
October, 2021 area-weighted rainfall

	Rank (of 61)	Normal (mm)	Average (mm)	Departure (percent)	Comment
Pakistan	57	8.0	18.7	134.3	5 th wettest (record 52.7 mm in 1997)
Azad Jammu & Kashmir	55	26.5	55.5	109.4	7 th wettest (record 118.9 mm in 2004)
Balochistan	56	3	10.7	261.3	6 th wettest (record 51.8 mm in 1997)
Gilgit Baltistan	54	8.8	16.2	83.3	8 th wettest (record 103.0 mm in 1987)
Khyber Pakhtunkhwa	49	26.4	43.5	64.7	13 th wettest (record 94.0 mm in 2015)
Punjab	59	8.1	25.6	216.2	3 rd wettest (record 83.2 mm in 1997)
Sindh	52	4.3	6.4	47.2	10 th wettest (record 66.3 mm in 2004)

Rank ranges from 1 (lowest) to 61 (highest)

Rainfall – Excessively above average over the country

During October 2021, four rainfall events occurred with first spell started on 28th of previous month & lasted till 16th which produced considerable amount of rain. October 2021 rainfall was 134.3% above average for Pakistan as a whole and stood fifth wettest month on record for the country during 1961-2021. Rainfall for the month

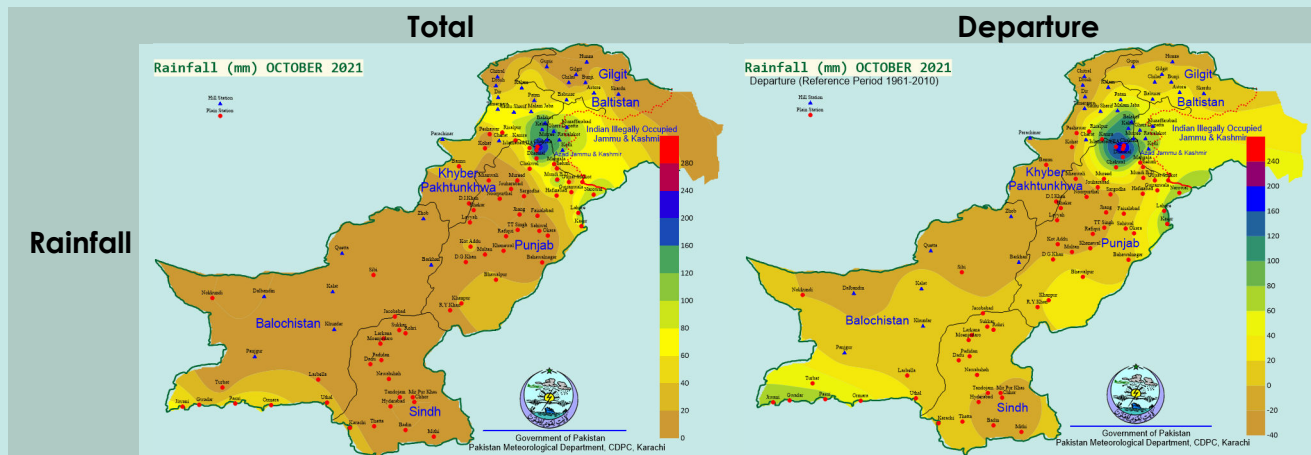


was above average across much of the country and largely above average for October in coastal rea, Northern KP, AJK and upper Punjab.

Although the month of October normally does not experience much rainfall and happens to be second driest month of the year across Pakistan but October 2021 saw just opposite to its normal behavior with record 18.7 mm rain (area weighted) against its normal 8.0 mm. On average, the October rainfall contribution is of the order of 30% and 3% to the post-monsoon (OND) and annual rainfall respectively.

On regional scale, all the regions/provinces witnessed more than average monthly rainfall. AJK (+109.4%), Balochistan (+261.3 %), GB (+83.3 %), Punjab (+216.2 %) and Sindh (+47.2 %) all experienced among tenth heaviest rainfall on record except KP (+64.7 %) where it was ranked thirteenth wettest. The wettest day of the month in the country was 18th October, when PAF Nur Khan (Punjab) recorded 117.7 mm of rain with same place being the wettest with 257.8 mm monthly total. The other chief amounts of monthly rainfall were: Islamabad-ZP (196.79 mm), Balakot (171.0 mm mm), Kakul (152.7 mm), Murree (129.5 mm) & Garhi Dupatta (126.5 mm).

OCTOBER 2021 rainfall maps



Temperatures – Warmer than average temperature over Country

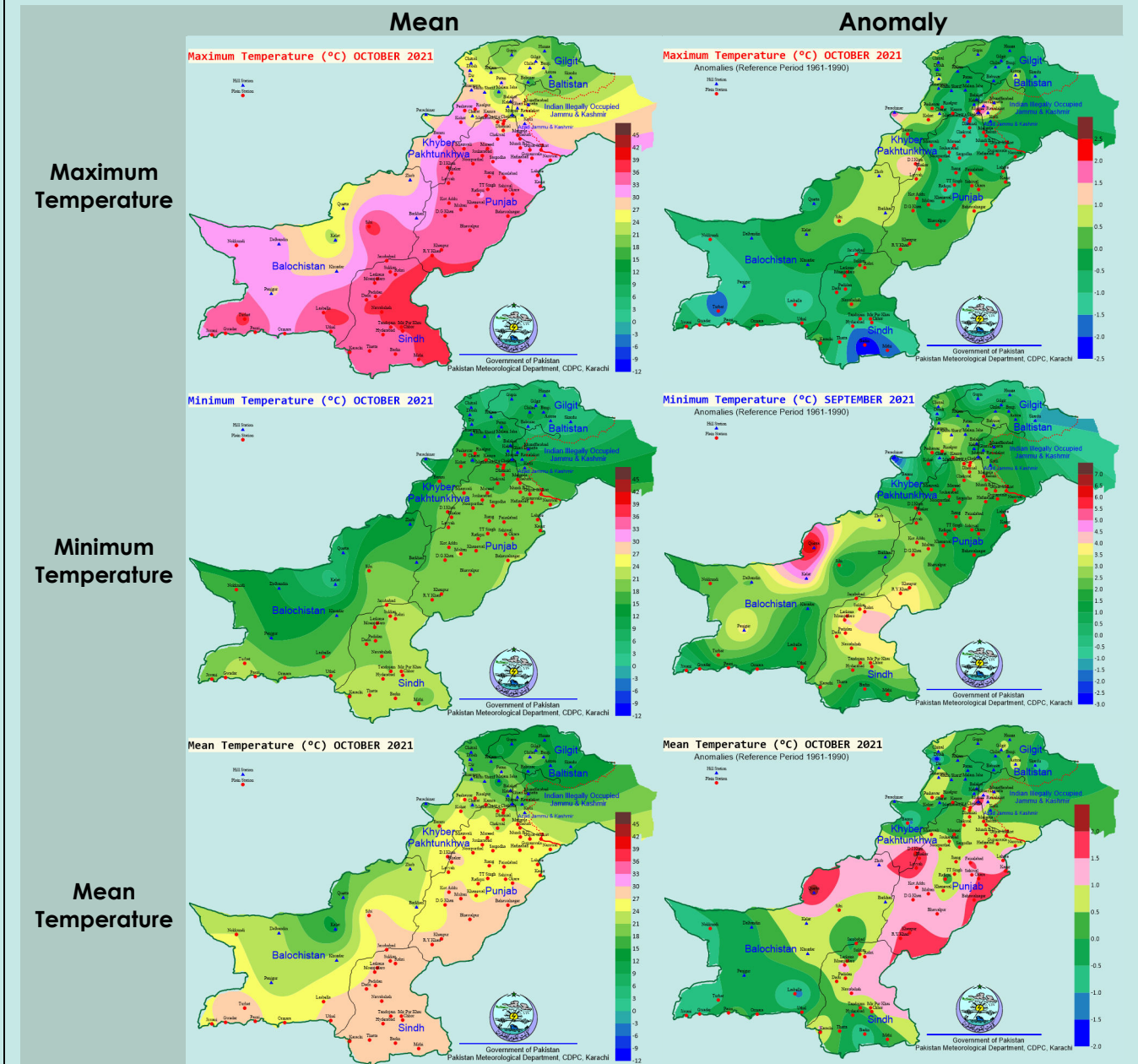
The national mean monthly temperature of October 2021 for Pakistan as a whole was 23.96 °C, being 0.60 °C warmer than monthly-average. On regional scale, AJK (+0.34 °C), Balochistan (+0.44 °C), KP (+0.41 °C), Punjab (01.14 °C) and Sindh (+0.51 °C) recorded warmer than average while GB (-0.16 °C) recorded negative anomaly for the month.

The mean maximum (day) temperature at country-level was 31.54 °C, being 0.27 °C lower than average of 31.28 °C. The night (minimum) temperature was 16.63 °C, being 1.41 °C warmer than country-average of 15.22 °C. The mean temperature

anomalies of October were 0-2 °C over most parts of the country except parts of Balochistan and Sindh where it was around 4 °C.

Mean Maximum temperatures' anomalies were ± 1 °C over most parts of the country except southern parts of Sindh where it was around -1.5 °C. The mean minimum temperature anomalies for the month were 0-3 °C over most parts of country with anomalies over western Balochistan and Sindh regions being considerably higher. The hottest days of the month were at Shaheed Benazirabad (Sindh) when it recorded 43.0 °C temperature on 8th & 9th October. The coldest temperature of -2.0 °C of the month were recorded at Kalam (KP) on 24th October 2021.

OCTOBER 2021 Temperature maps



October 2021 Monthly Averages & Normals

Station	Pressure (mb)		Temperature (°C)			Vapour (mb)	Precipitation	
	Station Level	Sea Level	Mean	Maximum	Minimum	Pressure	Total (mm)	Days
Drosh	853.5	1498.4	17.8	26.4	7.7	8.2	12.4	3
	855.3	1515.5	18.3	26.7	11.6	7.0	31.1	5.1
Peshawar	972.9	1010.0	24.0	32.4	16.5	18.3	7.0	3
	970.1	1010.5	22.9	31.6	15.9	16.0	19.0	3.2
Parachinar	828.4	1505.4	16.6	24.8	8.8	8.4	33.0	6
	829.4	1516.1	16.3	23.3	8.8	7.3	31.8	5.8
Rawalpindi	953.4	1010.4	22.9	29.1	17.3	16.4	257.8	6
	952.9	1010.9	21.8	30.9	14.0	15.0	29.8	3.8
Sargodha	986.7	1007.6	26.1	32.4	19.1	20.4	0.0	0
	989.4	1010.6	25.1	33.5	17.4	18.1	9.7	1.9
Jhelum	981.9	1008.4	24.9	32.4	19.0	21.3	18.6	5
	983.5	1010.3	23.8	32.7	16.6	17.8	18.5	3.3
Sialkot	980.1	1008.9	24.4	30.9	18.7	22.2	69.0	4
	981.8	1010.6	23.3	31.2	16.2	18.8	18.2	2.2
Zhob	858.0	1485.7	21.7	28.4	14.4	6.1	0.0	0
	859.0	1494.9	20.4	28.0	12.1	7.8	6.0	0.9
D.I.Khan	988.5	1007.9	26.9	35.0	19.9	20.0	0.0	0
	990.3	1009.9	24.8	33.2	17.1	17.8	5.8	1.6
Lahore	984.6	1008.7	26.4	32.1	21.0	20.9	60.1	3
	985.9	1010.2	25.4	32.8	18.5	18.1	14.8	2
Quetta	843.9	1527.4	17.0	24.7	8.9	3.9	1.0	1
	843.0	1518.6	15.8	25.5	4.7	6.2	6.5	1.1
Multan	994.1	1007.9	27.8	34.0	21.3	19.3	0.0	0
	996.1	1010.2	25.8	34.4	18.2	18.3	5.2	0.9
Barkhan	889.1	1487.4	23.5	30.8	16.7	8.0	2.0	1
	891.3	1505.1	22.7	29.8	16.0	9.4	8.9	0.5
Nokkundi	934.2	1009.3	24.5	32.3	15.8	4.8	0.0	0
	935.6	1010.5	24.7	33.1	16.0	8.2	0.3	0.1
Dalbandin	918.6	1514.1	22.9	31.5	11.8	6.7	0.0	0
	918.4	1533.8	23.0	31.4	10.5	5.8	0.1	0.2
Jacobabad	1002.5	1008.8	28.4	34.1	21.3	22.7	4.0	1
	1003.4	1009.7	27.7	35.1	20.2	18.8	2.2	0.1
Khanpur	998.1	1008.1	27.0	35.0	19.8	22.1	26.0	2
	999.4	1009.6	25.7	34.7	16.5	18.6	2.6	0.5
Panjgur	902.2	1493.3	22.7	29.6	14.5	7.5	7.0	2
	904.8	1513.1	22.9	30.3	14.0	5.8	2.8	0.3
Khuzdar	876.3	1494.8	22.8	29.7	16.1	6.9	6.0	1
	876.5	1494.7	22.7	29.9	13.8	3.7	7.4	0.5
Nawabshah	1005.6	1008.9	28.8	37.4	20.7	21.2	16.3	2
	1006.3	1010.2	27.6	37.1	18.2	20.6	4.9	0.1
Jiwani	1003.1	1009.5	27.8	32.2	20.3	23.8	78.0	2
	1004.7	1011.1	27.1	32.7	21.5	24.2	1.5	0.2
Pasni	1009.4	1009.9	27.5	33.4	21.8	17.7	77.0	2
	1009.3	1010.2	27.1	33.7	20.2	20.6	3.4	0.1
Hyderabad	1003.8	1008.7	29.3	35.8	23.0	19.7	0.0	0
	1005.8	1009.7	29.0	36.8	22.4	18.7	2.9	0.2
Chhor	1008.1	1008.8	28.8	36.2	21.7	23.6	0.0	0
	1008.7	1009.5	28.0	37.3	18.5	19.4	6.2	0.4
Karachi	1006.6	1009.2	28.6	34.9	23.1	22.8	17.2	2
	1008.0	1010.3	27.9	35.1	21.4	21.0	2.3	0.3

October 2021 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	25.6	1	11.6	25	34.4	1	2.0	23*	5.8	23	16	11*
Peshawar	29.4	1	15.8	24	37.0	15	9.5	31	5.0	5	4	1*
Parachinar	22.3	6	9.8	24	32.0	6	2.5	25	12.0	3	6	15*
Rawalpindi	27.5	4	16.1	24	33.2	15	11.4	26	117.7	18	40	10
Sargodha	30.8	1	20.4	24	36.5	8	12.5	26	0.0	0	16	10*
Jhelum	29.1	3	19.9	31	37.0	15	12.0	31	7.2	2	8	22*
Sialkot	28.8	3	17.4	23	35.0	15	12.8	29	23.5	23	8	23
Zhob	26.8	3	16.4	24*	33.0	3	9.0	29	0.0	0	15	22
D.I.Khan	31.9	1	21.5	25	38.5	1*	14.5	25*	0.0	0	8	5
Lahore	30.4	3	19.5	24	35.8	9	14.8	29	46.2	2	8	4*
Quetta	24.1	1	12.4	23	30.0	8	3.5	24	1.0	1	28	22
Multan	32.3	1	22.0	24*	38.3	10	15.5	25	0.0	0	14	22*
Barkhan	28.3	7*	17.9	25	36.0	8	10.5	25	2.0	3	4	2*
Nokkundi	33.0	1	19.5	23	38.5	8	10.5	13	0.0	0	22	22
Dalbandin	30.0	1	18.9	23	37.0	21	6.0	13	0.0	0	10	22
Jacobabad	32.5	7	24.1	25	37.0	6*	17.5	15*	4.0	1	4	11*
Khanpur	31.5	4*	22.1	25	39.0	7*	15.0	31	14.7	2	10	21
Panjgur	26.9	7	17.8	23	34.5	21	9.5	25	5.0	2	18	10
Khuzdar	26.4	3*	18.5	28	33.5	5	11.5	28	6.0	1	6	6*
Nawabshah	33.3	4	24.5	25	41.5	4*	16.5	26*	15.3	7	12	3
Jiwani	31.1	1	25.6	3	37.5	15	18.0	23*	40.0	3	34	2
Pasni	30.1	11	24.3	25	37.5	7*	17.5	26*	49.0	2	36	1*
Hyderabad	32.4	7	26.1	25	38.6	15	20.5	18*	0.0	0	20	4
Chhor	32.4	7	26.1	30	38.5	7*	15.5	30	0.0	0	10	21*
Karachi	31.1	7	27.0	31	38.3	13	17.9	17	10.2	1	20	1

* 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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