

CLIMATOLOGICAL DATA FOR AUGUST, 1913.

DISTRICT NO. 8, TEXAS AND RIO GRANDE VALLEY.

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GENERAL SUMMARY.

The warm, dry weather of July continued throughout August. The sunshine was again excessive and the number of rainy days below the average. The mean temperatures were well above the normal in the northern portions of the district, and near normal or slightly below in southern New Mexico and in southwestern Texas. While the day temperatures were persistently high, there was no exceptionally hot weather such as occurred in Oklahoma and Kansas.

During the last 26 years there were only 4 years in which August was drier in Texas than in the current month, but the combined rainfall for July and August of this year is the lowest of record during this period. The protracted dry, hot weather was destructive to vegetation in many localities and cut short the cotton crop in central and northern Texas. The deficiency of precipitation was most marked in eastern New Mexico and in northern Texas, while excesses occurred at a few scattered stations in the middle Rio Grande Valley and in southern and central Texas. The drought was not general over any considerable area, owing to the local character of the rainfall. Several observers remarked that while there were good rains in portions of their counties, the crops were burning up in other portions because of lack of moisture. An unusual feature of the weather was the large number of dry thunderstorms or of thunderstorms that were attended by inappreciable amounts of precipitation only. Showers occurred daily in some portion of the district, but there were no well-defined storm periods. The average number of days with 0.01 inch or more of precipitation was 9 in Colorado, 7 in New Mexico, and 4 in Texas. A trace of snow occurred at Taos Canyon, N. Mex.

The greatest and least monthly amounts of precipitation were, respectively, in Colorado, 3.56 inches at Platoro, and 0.50 inch at Manassa; in New Mexico, 4.83 inches at Harveys Upper Ranch, and none at Elida; and, in Texas, 8.93 inches at Beaumont, and none at 12 stations, while a trace only occurred at 10 others. Excessive precipitation of 2.50 inches or more in 24 consecutive hours occurred at 4 stations in Texas, the heaviest being 5.27 inches at Beaumont on the 18th.

TEMPERATURE.

The monthly mean temperature was 2° above the normal in Colorado, 0.1° below in New Mexico, and 1.4° above in Texas. There were no well-defined warm or cool periods, and both the highest and lowest temperatures of the month were generally recorded during the first decade, except in the eastern half of Texas, where the coolest nights occurred between the 24th and 27th. The day temperatures were uniformly high and aggravated the injurious effects of the dry weather. The mean daily range of temperature varied from 10° on the Texas coast to 37° in the western portion of the district.

The highest and lowest temperatures reported were, respectively, in Colorado, 92° at Saguache on the 3d, and 26° at Hermit on the 16th; in New Mexico, 105° at Artesia on the 8th, and 32° at Red River Canyon on the 2d; and, in Texas, 110° at Graham on the 26th, and 53° at Marathon on the 12th and at Boerne on the 26th. The local monthly means ranged from 52.8° to 67.2° in Colorado, from 56.4° to 79.7° in New Mexico, and from 71.7° to 88.2° in Texas.

PRECIPITATION.

The average precipitation for the Rio Grande watershed was 1.63 inches, which is 0.49 inch less than the normal. Good showers occurred locally in the middle portions of the watershed, but elsewhere the deficiency was general.

The Rio Pecos watershed had an average precipitation of 1.87 inches, which is 1.01 inches less than the normal. All stations in this watershed had less than the normal amount, but the deficiency was most marked over the Texas portion.

Of the Texas watersheds the Guadalupe and Lavaca received more than the normal amount of moisture with an excess of 0.41 inch for the former and of 0.50 inch for the latter watershed. The remaining Texas watersheds showed deficiencies ranging from 0.46 inch for the Colorado watershed to 1.80 inches for that of the Sabine. Little or no rain occurred at a number of stations in the upper portions of the Brazos, Trinity, and Sabine drainage areas, and over the lower coastal plains. Good local showers were reported from the upper Texas coast and from the lower portions of the Colorado and Brazos watersheds. The following are the monthly amounts in inches and hundredths for the various Texas watersheds: Nueces, 1.43; San Antonio, 1.35; Guadalupe, 2.47; Lavaca, 2.48; Colorado, 1.61; Brazos, 1.07; Trinity, 0.78; Neches, 2.03; Sabine, 0.45; and coastal plains, 1.51.

RIVER CONDITIONS.

Slight rises occurred in the middle Trinity between the 3d and 6th, and in the lower Colorado on the 10th; but during the latter half of the month these and all other streams in the district were practically at low-water mark.

MIDSUMMER SHOWERS AT GALVESTON, TEX.

By W. P. STEWART, Local Forecaster.

The convectional showers which occur with considerable regularity during the summer months over the mainland near the east Texas coast fall only occasionally on Galveston Island. The reason for this is that the southerly winds usually prevailing when these showers occur have practically the same temperature as the waters of the Gulf of Mexico, from which they have just come. They are, therefore, comparatively cool, and have little tendency to rise. After they have passed inland a few

miles, however, they become sufficiently warm to induce the convectional ascent that results in local showers. These showers occur, therefore, usually a few miles inland, and not on the immediate coast.

Occasionally a heavy summer rain falls in the vicinity of Galveston in connection with a disturbance of tropical or semitropical origin, and at infrequent intervals some rain results from an unusually strong area of low pressure passing across the State to the northward, but the greater number of summer rains, particularly in August and the latter part of July, appear to come from a convectional overturning of the air strata that takes place in a manner somewhat unusual. It differs from the usual convectional overturning in the fact that the action is due not so much to the overheating of the lower air as to the cooling of the upper air.

These rains come as a series of showers, mostly from cumulo-nimbus clouds. They occur more frequently at night and mostly during the latter part of the night. As a rule the showers are of brief duration, but the series lasts from one to four days. They come only when an area of high pressure covers the middle and eastern Gulf States. As the area of high pressure passes away the showers cease, without change of either wind or temperature. The wind usually is from the south, although it may be anywhere from northeast to south. Upper clouds from the east or northeast usually are visible.

These showers appear to begin over the Florida Peninsula and to move progressively northwestward across the Gulf of Mexico, skirting the southern edge of the field of

high pressure. They may be observed at Key West about 48 hours and at New Orleans 24 hours before they begin at Galveston.

Locally, what takes place appears to be about as follows: A sheet of cool air spreads out aloft from the high-pressure area toward the west or southwest. That this is a fact is evidenced by a sheet of alto-stratus or alto-cumulus clouds which usually may be seen moving from the east or northeast and probably marks the intersection of the cool overflowing stratum and of the lower air, kept warm and moist by the waters of the Gulf.

The weight of the overlying sheet of comparatively cool air causes a condition of unstable equilibrium, from which convectional action results. Hence the cumulo-nimbus clouds and the local thunder showers. That the process usually is initiated, and is more vigorous at night, is due to the fact that radiation from the upper cloud sheet causes a further cooling aloft, and consequently increases the instability.

When the condition is strongly developed, the showers continue well into the forenoon, but usually the convectional action ceases by 8 or 9 a. m. This appears to be due to the warming up of the air about the alto-stratus level, for as these clouds dissipate the cumulo-nimbus clouds also are seen to subside. The surface air remains at about the same temperature as during the night, which in the month of August is about 80°.

The conditions mentioned herein do not obtain in the early summer, as the waters of the Gulf are not then sufficiently warm.