

CLIMATOLOGICAL DATA FOR AUGUST, 1912.

DISTRICT No. 7, LOWER MISSISSIPPI VALLEY.

ISAAC M. CLINE, District Editor.

GENERAL SUMMARY.

Moderate temperature conditions prevailed throughout the month, except that from the 24th to 31st maximum temperatures were considerably above the normal in Oklahoma and the Kansas area, the readings being 100°, or higher, at some stations every day. The precipitation was light generally, but it was well distributed, except in parts of eastern Oklahoma, northwestern Arkansas, and the western portion of the Missouri area where the rainfall was insufficient for agricultural needs. In Oklahoma, droughty conditions were prevailing in many localities at the close of the month. There was no snowfall within the district.

The following table summarizes the chief features of meteorological interest in the various portions of the district.

States and portions of States lying within District No. 7.	Mean temperature.	Departure from normal.	Mean precipitation.	Departure from normal.	Greatest precipitation in 24 hours.	Mean snowfall.	Number of days.				
							With 0.01 inch, or more.	Clear.	Partly cloudy.	Cloudy.	Prevailing direction of wind.
Colorado.....	64.8	-1.2	1.79	-0.26	2.75	0	8	17	10	4	sw.
New Mexico.....	70.3	-0.4	2.89	-0.07	4.05	0	8	13	14	4	sw.
Texas.....	78.7	+0.8	3.69	+1.63	5.91	0	8	16	10	4	sw.
Kansas.....	78.6	+0.5	3.71	+0.61	5.50	0	8	18	10	4	sw.
Oklahoma.....	80.2	+0.6	3.29	+0.54	5.10	0	8	19	8	5	sw.
Missouri.....	76.4	+0.1	3.57	+0.03	2.52	0	7	18	8	5	sw.
Tennessee.....	77.4	-0.7	4.10	+1.10	2.40	0	7	17	10	5	sw.
Arkansas.....	78.7	-0.4	3.30	-0.17	3.12	0	7	15	10	5	sw.
Mississippi.....	79.6	-0.5	5.21	+1.26	3.50	0	7	16	10	5	sw.
Louisiana.....	81.3	-0.1	5.89	+1.13	6.47	0	11	13	9	5	sw.

TEMPERATURE.

Mean temperatures were from 0.1° to 2.9° below the normal over the Colorado and New Mexico areas, and in scattered localities in Oklahoma, Arkansas, Louisiana, and the Kansas, Texas, and Mississippi areas; elsewhere, there was an excess ranging from 0.1° to 2.8°. Over many parts of the area, high temperatures occurred toward the close of the last decade. The highest temperature recorded, 110°, occurred at Jefferson, Okla., and at Cunningham and Lacrosse, Kans. A maximum reading of 105° was recorded at Bee Branch, Ark., and 104° at Bonham, Tex., and Liberty Hill, La. The lowest temperature recorded was 29°, at Elizabethtown, N. Mex., and a minimum reading of 30° was recorded at Lake Moraine, Colo.

PRECIPITATION BY DRAINAGE AREAS.

Arkansas River and tributaries.—The precipitation was unevenly distributed over this drainage area. In Colorado the average from 33 stations was 1.80 inches, about 0.3 inch below the normal. Over those portions of the Arkansas Valley proper that lie in Kansas and Oklahoma, the average from 46 stations was 3.80 inches, about 1 inch

in excess of the normal. In the Canadian Valley the average from 69 stations was 2.80 inches, about the normal amount. The amounts from 21 stations in the Cimarron Valley averaged 3.75 inches, about 0.4 inch above the normal. Over the Verdigris and Neosho Valleys the precipitation averaged 2.84 inches, about 1 inch below the normal. Below the Oklahoma-Arkansas line, the average from 15 stations in the Arkansas Valley was 3.12 inches, about 0.6 inch below the normal.

Red River and tributaries.—More than the normal precipitation occurred in nearly all portions of this drainage area. Over those portions of the Red River Valley that lie in New Mexico, Texas, and Oklahoma, the average from 44 stations was 4.18 inches, about 2 inches above the normal. Below the Texas-Arkansas line, the average from 21 stations was 5.30 inches, about 2.3 inches above the normal.

Mississippi River south of St. Louis and small tributaries.—More than the normal precipitation occurred over the greater portion of this drainage area, but the amounts were unevenly distributed. In the immediate Mississippi Valley the average from 38 stations was 4.35 inches, about 1 inch above the normal. The average from 23 stations in the Valley of the White River was 2.66 inches, about 1 inch below the normal. Over the Yazoo Valley the average from 21 stations was 4.98 inches, about 1.2 inches above the normal. The average for the Valley of the Big Black was 6.58 inches, about 2.5 inches above the normal. In the Ouachita Valley the average from 20 stations was 4.49 inches, about 1 inch above the normal.

Louisiana coastal plain.—The precipitation was unevenly distributed over this drainage area, and the average from 32 stations was 6.26 inches, about 0.8 inch above the normal.

RIVERS.

No high water occurred in the Arkansas River during the month, and at Little Rock the stages were too low for navigation except on a few days.

The White River was unusually low, and at Calico Rock was below the zero of the gage during the greater part of the last decade of the month.

Low stages prevailed in the Ouachita throughout the month.

No floods occurred in the Red River, and the stages were generally low.

Except for a few unimportant rises, the Mississippi River below St. Louis fell at all points.

TORNADO AT BOONEVILLE, ARK.

By H. F. ALCIATORE, Section Director, Little Rock, Ark.

A destructive local storm occurred at Booneville, Logan County, Ark., about 11.45 p. m., August 3, 1912.

The postmaster at that place reported that (1) the storm moved from SW. to NE.; (2) that a pendant, funnel-shaped cloud was observed; (3) that the path of great destruction was about 250 yards wide; (4) that the damage

sustained in the city, as to loss in wrecked buildings, water-soaked household effects, merchandise, etc., was about \$50,000, and the loss to crops about \$10,000; (5) that no one was killed, but that six persons were injured.

Dr. E. F. Hodges, of Booneville, in a press dispatch, has stated that:

Later reports showed that 48 houses were either partially or totally destroyed; that the lowest estimate of the damage sustained was about \$50,000; and that the heavy rains in Logan County did great damage to crops in the lowlands.

Another press report from Booneville says: (1) That the wind blew at an estimated velocity of 75 miles an hour, and that the storm was accompanied by a heavy downpour of rain; (2) trees were uprooted, fences were lifted high and strewn about the streets; houses, some remaining intact and some completely wrecked, were lifted from their foundations and carried some distance; many buildings were unroofed, as were several freight cars standing in the railroad yards; (3) the high school building had all the interior wrecked by the storm, while the walls remained intact.

This storm developed in the northwest quadrant of a small and shallow barometric depression that was central over the central part of Arkansas on the morning of August 3, with unusually steep barometric gradient to the northward. The pressure was 29.98 inches, and the wind northeast at Fort Smith (about 33 miles northwest of Booneville), and 29.95 inches, and wind northwest at Little Rock.

The tornado appears to have spent all its force within the limits of Booneville and its suburbs.

CAUSE OF THE EQUABLE TEMPERATURE CONDITIONS AT NEW ORLEANS, LA.

By EDWARD D. COBERLY, Local Forecaster.

It is a well-known fact that proximity to large bodies of water renders the climate of any locality less severe and gives greater freedom from sudden changes than is enjoyed by places removed from an extended water surface. When the locality is nearly or quite surrounded by water, this effect is accentuated, and stands out clearly when the records of temperatures are examined from places differently located with reference to the water surface.

It is the purpose of this article to show in a brief manner why the winter climate of New Orleans is less severe and the summer weather cooler and more pleasant than at places located farther inland or at places located on the open Gulf, but with no large body of water to the northward to protect them against the extreme heat of summer and cold of winter carried by the northerly winds from the interior of the country.

New Orleans is practically surrounded by a water surface, and in addition the level of ground water in the city itself is very high, keeping the surface much more nearly in a saturated condition than in the other localities considered in this investigation. To the north of the city is Lake Pontchartrain, a body of water of large extent, but relatively shallow (its greatest depth being but 15 to 20 feet), to the northwest is Lake Maurepas, to the southwest Lake Salvador, and to the east Lake Borgne, while to the southward, 40 to 60 miles distant in a straight line, is the broad expanse of the Gulf of Mexico, and directly in front of the city, almost inclosing it in a curve, runs the Mississippi River, approximately three-fourths of a mile wide and more than 100 feet deep. In addition to the aforementioned bodies of water, there are in this vicinity large areas of marsh land, covered with water

during the larger part of the year, and numerous creeks and bayous course the region, so that the reader can readily see that the proportion of water to land surface is very large.

Physical experiments tell us that it takes about four times as many calories of heat to raise the temperature of a water surface by a given amount as it does to raise the temperature of a land surface by the same amount. The exact proportion varies with the character of the land surface, a sandy surface heating up more quickly in the sunlight and cooling more quickly in the shade than a similar surface composed of a clay soil. Likewise in cooling during the night and in winter the water surface cools much more slowly than the land and liberates a much larger quantity of heat than a land surface would liberate in cooling the same number of degrees. In other words, if the temperature of a water surface is lowered 1°, enough heat is liberated to raise the temperature of the overlying air about 4°, while a land surface in cooling 1° would liberate only enough heat to raise the temperature of the overlying air one-fourth degree. This shows very clearly that the large water surface adjacent to the city of New Orleans must exert a great influence on the temperatures there observed. Indeed, if it were not for this influence, there is no doubt in the writer's mind the summers would be much hotter and the winters much colder than they now are.

In order to bring out the facts in the case, the climatic records for New Orleans, La., Amite, La., located north of Lake Pontchartrain some distance, and in a county characterized by loose, sandy soil, and Mobile, Ala., with Mobile Bay on the Gulf side, but with no water surface to the northward, have been summarized, and the results are presented herewith. The locations of the places discussed are such that with similar exposure relative to the water surface there should be no such differences in temperatures as are seen to exist.

Let us first consider the normal temperatures of the places month by month. January is the coldest month of the year, the monthly mean at New Orleans being 53.0°, while at Mobile it is 49.8°, or 3.2° degrees colder than at New Orleans, and at Amite it is 51.3°, or 1.7° colder than New Orleans. During the midsummer months the means differ but little, the prevailing winds at all places then coming from the southward, and consequently off a water surface, the July mean at both New Orleans and Amite being 81.3° and at Mobile 80.5°, while during August Amite is the warmest of the three places, as was expected from the location of the place, the greater frequency of winds from a northerly quarter, and the fact that there are fewer rainy days at that station during August than July, thereby allowing the sandy soil to heat rapidly by day, thus storing more heat than is lost at night by radiation.

We will now take up the mean maximum temperatures. During the winter months the differences in mean maxima are not marked, but it is noted that the mean maximum at Amite is higher than at either Mobile or New Orleans, which is as expected from its location, the sandy soil heating rapidly by day and warming the overlying air by conduction and local convection. In summer the differences are more marked and more important from the standpoint of comfort of the inhabitants of the cities. July is the warmest month, considering the maximum temperatures, in New Orleans, the mean maximum being 89°; June and August have mean maxima of 87° and 88°, respectively. At Mobile the mean maximum for June is 88°, July 90°, and August 89°, while the same months at Amite show 91°, 92°, and 92°, respectively. This shows clearly how