

DETAILS OF THE WEATHER IN THE UNITED STATES.

551.506 (73)

GENERAL CONDITIONS.

By A. J. HENRY, Meteorologist.

The larger features of the weather of the current month were (1) relatively low atmospheric pressure except in the extreme southeast and the extreme northwest; (2) a return to the type of temperature distribution which prevailed in the early summer months; (3) torrential rains in southwestern Texas, very generous rains over Missouri, eastern Iowa, northwestern Illinois and southwestern Wisconsin, and about normal rains in Washington and Oregon. In other parts of the country drought prevailed, though not especially marked except in the Florida peninsula.

CYCLONES AND ANTICYCLONES.

By W. P. DAY, Observer.

The number of low-pressure areas plotted considerably exceeded the normal, but they moved, as a rule, in high latitudes. Indifferent air pressure within the Tropics resulted in the formation of three hurricanes, not included in the tables, but plotted on Chart III and numbered V, VI, and IX, respectively. These storms were of small diameter, but of the greatest intensity.

High-pressure areas, budding off from the north Pacific HIGH, were three times as frequent as the normal, while the two HIGHS originating in the interior north of Alberta, though reinforced, were not important in reducing the temperature except in the northern Rocky Mountain region. The movement and character of the HIGHS and LOWS were favorable for warm weather over eastern districts.

Tables showing the number of HIGHS and LOWS by type follow:

LOWs.	Al-ber-ta.	North Pa-cific.	South Pa-cific.	North-ern Rocky Moun-tain.	Colo-rado.	Texas.	East Gulf.	South At-lantic.	Central.	Total.
September, 1921.	5.0	.....	1.0	.....	5.0	.....	.....	2.0	4.0	17.0
Average number, 1892-1912, inclusive.....	4.1	1.1	0.4	0.6	0.7	0.3	0.4	0.2	0.7	8.5

HIGHS.	North Pacific.	South Pacific.	Al-ber-ta.	Plateau and Rocky Moun-tain region.	Hudson Bay.	Total.
September, 1921.	6.0	.....	2.0	2.0	2.0	12.0
Average number, 1892-1912, inclusive.....	2.1	1.0	3.5	0.7	0.6	7.9

THE WEATHER ELEMENTS.

By P. C. DAY, Climatologist and Chief of Division.

[Weather Bureau, Washington, Nov. 1, 1921.]

PRESSURE AND WINDS.

As has been the case for a number of months past, pressure changes were usually moderate in degree and a general stagnation of the atmospheric circulation existed during long periods over the southeastern districts, where the pressure continued somewhat higher than normal.

Along the northern border cyclonic areas were noted at frequent intervals, though in most cases they affected rather small areas.

Anticyclones entered the country mostly from the north Pacific coast and, drifting slowly eastward over the central and southern districts, produced, as is usually the case, no important temperature changes. In two instances, however, anticyclones entered the United States from the Canadian Northwest and in their movement southward brought the most important temperature changes of the month. The first, about the 10th to 13th, overspread the western mountain and Plateau districts, and the second, a combination north Pacific and Canadian high area, materially lowered the temperatures over most western and central districts on the last two days of the month.

The average pressure for the month was slightly above 30.05 inches over the Southeastern States and a small area having similar pressure existed in the extreme Northwest. Average pressure was below 29.95 inches along the northern border from Montana eastward.

Save over the Southeastern States and locally along the Pacific coast, and in the far Northwest, pressure was below normal in all portions of the United States and in Canada also, as far as observations disclose.

The diminishing pressure from the southeastern districts toward the northern border favored a continuation of southerly winds over practically all districts from the Rocky Mountains eastward, which conditions have been noted so prominently during much of the present year.

The principal period with high winds over an extended area was on the last day of the month, in connection with the movement of a cyclonic area of considerable force over the Great Lakes. At Buffalo, N. Y., a velocity of 78 miles per hour was registered on that date, the second highest velocity ever recorded at that station in September. In other portions of the country high winds were local and usually occurred in connection with thunderstorms.

TEMPERATURE.

The outstanding feature of the weather of the month was a continuation of the abnormal warmth that has persisted to such an unusual extent over much of the country east of the Rocky Mountains during the present year, and over considerable areas unusual warmth has prevailed even farther back into the latter part of the preceding year. In fact portions of the upper Mississippi Valley and Great Lakes regions have had monthly mean temperatures constantly above normal for the past 13 months. The high monthly means of temperature were due to continued warmth throughout the month and not to periods of unusually high temperatures, some portions of Southeastern States having daily temperatures above the normal throughout the entire month.

No portion of the month had outstanding temperatures that marked the culmination of a heated period, but the maximum temperatures were distributed through all the periods in some portion of the country, although the first few days were warmest over most central and eastern districts.

While protracted heat dominated the eastern two-thirds of the country, a marked reaction to cooler weather existed in the far West, particularly in the northern Plateau and Rocky Mountain sections, where the month was nearly as continuously cool as it was warm in the more eastern districts.

Minimum temperatures in the northern Plateau region about the 11th to 13th were in some localities the lowest of record for September, and killing frosts were the earliest ever known. Also near the end of the month temperatures were again quite low, extending eastward into the Great Plains and central valleys at the close.

For the month as a whole temperatures averaged above normal in all districts from extreme southern California to the Dakotas and thence eastward to the Atlantic, and over a narrow strip along the immediate Pacific coast.

Over many of the eastern and southeastern portions of the country the month was the warmest September in more than 50 years, and in New England the record at New Haven, Conn., extending back 143 years, shows only one September with a higher mean. Over the Plateau and central and northern portions of the Rocky Mountains the month was from 3° to 6° cooler than normal, and at points in Idaho, eastern Oregon, and western Montana, it was the coldest September of record.

Maximum temperatures were above 100° in most of the Central and Southern States, and in the Plains region they were observed as far north as the Dakotas.

Minimum temperatures were not below the freezing point over the greater part of the country east of the Great Plains, and no killing frosts occurred except along the northern border. In the far Northwest killing frost occurred about the beginning of the second decade, and at the lower elevations of the Rocky Mountains and over the Great Plains it was delayed till the close of the month.

PRECIPITATION.

Rainfall during the month was, as a rule, poorly distributed both in amount and in the times of occurrence.

Over the Ohio and upper Mississippi Valleys and Great Lakes region, precipitation was too frequent and heavy, particularly during the first and second decades, while along the Atlantic coast and over the Gulf States as far west as Texas and generally from the central Plains to the Pacific it was infrequent and light. In Texas unusually heavy rains occurred near the end of the first decade, the amounts at some points exceeding 20 inches

in 24 hours, the heaviest ever reported in the United States in that period of time. A full account of this and the attending loss of life and damage to property from the resulting floods will be found in another portion of this REVIEW. Over the far Southwest some unusually heavy rains for that region occurred on the last day of the month, and good rains occurred in the far Northwest during the latter part of the second and the early part of the third decades.

For the month as a whole precipitation was above normal over the Plains region from Texas to the Canadian border and eastward to the Ohio Valley and Great Lakes, and in portions of the far Northwest. Along the Atlantic coast from Maine to Florida, precipitation was insufficient for agricultural needs, and similar conditions were rather general in the Gulf States except eastern Texas. In Florida the precipitation was barely one-third the usual fall for September and at points the month was one of the driest in 50 years.

SNOWFALL.

On the 9th and 10th of the month an unusual snow-storm, for so early in the season, occurred in the mountain portions of central Montana, where depths up to nearly 15 inches were reported. In a few other districts snowfall was reported but only for the highest elevations.

RELATIVE HUMIDITY.

The drought conditions over the Atlantic and Gulf coast were definitely outlined by the negative departures of the relative humidity of the month as compared with the normal, while the excesses over the Mississippi and Ohio Valleys show the regions of heavy and frequent precipitation.

From the Great Plains westward to the Pacific the relative humidity was very generally less than the normal, although in the far Southwest heavy rains increased the relative moisture content of the air and in the far Northwest the continued cool weather had the same effect.