

# MONTHLY WEATHER REVIEW.

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The MONTHLY WEATHER REVIEW summarizes the current manuscript data received from about 3,500 land stations in the United States and about 1,250 ocean vessels; it also gives the general results of the study of daily weather maps based on telegrams or cablegrams from about 200 North American and 40 European, Asiatic, and oceanic stations.

The hearty interest shown by all observers and correspondents is gratefully recognized.

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As far as practicable the time of the seventy-fifth meridian is used in the text of the MONTHLY WEATHER REVIEW.

Barometric pressures, both at land stations and on ocean vessels, whether station pressures or sea-level pressures, are reduced, or assumed to be reduced, to standard gravity, as well as corrected for all instrumental peculiarities, so that they express pressure in the standard international system of measures, namely, by the height of an equivalent column of mercury at 32° Fahrenheit, under the standard force, i. e., apparent gravity at sea level and latitude 45°.

## FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

Unseasonably low temperature in middle and eastern districts of the United States, with frost in the interior of the Gulf and South Atlantic States and snow in the upper Ohio Valley, marked the opening of May. Over the Azores, where the barometer had been exceptionally low during the last five days of April, pressure continued below 30.00 inches until May 9. In the Iceland area, where pressure had been high during the last half of April, the barometer continued above 30.00 inches until May 6.

A depression that occupied the Lake Superior region on the 1st advanced over Canada and the Atlantic and reached the British Isles on the 6th, its passage over the ocean being attended by strong gales. A depression that appeared on the north Pacific coast on the 1st moved over the Plateau and Rocky Mountain districts during the 2d and 3d, drifted slowly over the central valleys from the 4th to the 7th, occupied the Atlantic coast from the 9th to the 11th, and reached the British Isles on the 14th. Depressions that leave the American coast at this season of the year usually advance toward and merge into the great Iceland low area. The southern course of the two depressions, here referred to, was due to the prevalence of abnormally high pressure over Iceland and persistent low pressure over the Azores. The depressions, advancing along the line of least resistance, were deflected to the southward of the usual path.

The depression that crost the American Continent during the first decade of the month was attended by exceptionally heavy rains in localities in the Gulf and Atlantic States, and the middle Mississippi and Ohio valleys, and was followed by snow and freezing temperature in the middle and northern Rocky Mountain districts and thence over the northern portion of the Lake region. Its slow advance was apparently due to the persistent and abnormal distribution of atmospheric pressure over the Atlantic and western Europe above referred to.

The Cheyenne Tribune, of May 4, 1908, has the following editorial concerning a forecast issued at Washington, D. C., May 2, for the following week:

The weather man down at Washington has made an excellent guess. Saturday he gave to the Associated Press the following:

The rains of the week beginning Sunday, May 3, will cover the principal agricultural districts from Canada to the Gulf of Mexico. From May 3 to 5 an area of general rains will advance from the Pacific to the Atlantic coasts, reaching the Atlantic coast Monday night or Tuesday. \* \* \*

The storm Cheyenne is now enjoying arrived promptly as scheduled and is worth more to Laramie County than can be measured in dollars and cents. The precipitation is probably general over Wyoming.

The rains referred to broke a drought in Wyoming and eastern Colorado that was becoming serious.

A barometric depression that apparently crost the southern California coast on the 10th and 11th advanced slowly eastward over the Plateau and Rocky Mountain districts and north-eastward over the Great Plains and north-central valleys from the 11th to the 15th, attended by exceptionally heavy rains and severe local storms in Louisiana and Arkansas on the 12th, and in Louisiana, eastern Texas, and Arkansas on the 13th. On these dates also heavy rains fell in parts of Nebraska, Missouri, Iowa, Illinois, and Indiana.

From the 13th to 15th an area of high barometer, attended by unseasonably cool weather, advanced from Manitoba to the north Atlantic coast, and the barometer continued high in the northeast until the 19th, when an area of low barometer that appeared over Nevada on the 14th reached that region.

The week beginning Sunday, May 17, opened with high barometric pressure over southern and low pressure in northern latitudes of the Northern Hemisphere, a distribution that indicated for the following seven days temperature about or above the seasonal average with showery weather over the middle and northern sections and settled fair weather over the Southeastern States of the United States. A justified forecast to this effect was issued on the 18th.

On the 19th and 20th a barometric depression covered the Rocky Mountain districts and low pressure, with extensive areas of local rains and thunderstorms, covered the western interior river valleys during a great portion of the third decade of the month. In the Southwestern States the rains of this

period were exceptionally heavy and resulted in devastating floods in Texas and Oklahoma. The persistent low pressure over the interior caused in the Eastern States a continuation of southerly winds and abnormally high temperature until the arrival in that section of a disturbance that appeared near Santo Domingo, W. I., on the 24th. This disturbance arrived off the North Carolina coast on the 29th, reached the neighborhood of New York, N. Y., the night of the 30th, and past thence northeastward over the Canadian Maritime Provinces. The gales that attended its passage along the Carolina and middle Atlantic coasts were severe, and due and timely notice was given of their occurrence.

Following the northeastward passage of the West Indian storm an area of high barometer and cool, fair weather advanced from the British Northwest Territory over the Lake region and north-central valleys at the close of the month.

During the last six days of the month a barometric depression, a typhoon, apparently advanced from west of Luzon, Philippine Islands, toward the Japanese coasts.

BOSTON FORECAST DISTRICT.\*  
[New England.]

The month was warmer than usual and there was more than the usual amount of precipitation. The first decade of the month was cool and temperature was generally above the normal during the remainder of the month. On the 2d and 3d temperature thruout the section was near or slightly below freezing, and on the 26th maximum readings between 85° and 90° were noted. Storm warnings were displayed on the 6th and 30th, and were fully justified. There were no storms for which warnings were not ordered.—*J. W. Smith, District Forecaster.*

NEW ORLEANS FORECAST DISTRICT.\*  
[Louisiana, Texas, Oklahoma, and Arkansas.]

The first decade of the month was cool and frost, for which warnings were issued, occurred in the northwestern part of the district on three dates. During the latter half of the month temperature was above normal. No general storms occurred on the Gulf coast and no storm warnings were issued.—*I. M. Cline, District Forecaster.*

LOUISVILLE FORECAST DISTRICT.\*  
[Kentucky and Tennessee.]

The month opened cold, with heavy frost in Kentucky and northern Tennessee and light frost in southeastern Tennessee the morning of the 1st. Abnormally cold weather in the first decade was followed during the balance of the month by abnormally high temperature. Rainfall was about normal in Kentucky and below normal in Tennessee. No special warnings were issued.—*F. J. Walz, District Forecaster.*

CHICAGO FORECAST DISTRICT.\*  
[Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas, and Montana.]

Rainfall was exceptionally heavy over the greater portion of the district. During the early part of the month temperature was considerably above normal, while later it was above normal in the eastern and below in the western portions. Storm warnings were issued to upper Lake ports several times during the month, and while the warnings were, as a rule, verified there were no exceptionally severe storms, except in the case of a few thundersqualls. Verified frost warnings were issued during the first decade, and again during the third decade for a few of the Northwestern States.—*H. J. Cox, Professor and District Forecaster.*

DENVER FORECAST DISTRICT.\*  
[Wyoming, Colorado, Utah, New Mexico, and Arizona.]

In northern Utah and parts of Wyoming rainfall was heavy. At Salt Lake City the amount was the greatest of record for May. Temperature was lower than usual and frost was frequent, except in extreme southern portions of the district. Warnings of the frosts were given in the regular forecasts,

and for severe frosts and freezing temperatures general and more effective distributions were made. As a result of heavy rainfalls, rivers in Wyoming reached high stages. Owing to the light winter snowfall and cool weather, stages in the Colorado and Rio Grande rivers were much lower than usual, while discharges from the Arkansas and South Platte rivers were insufficient to meet the needs of irrigation enterprises.—*F. H. Brandenburg, District Forecaster.*

SAN FRANCISCO FORECAST DISTRICT.†  
[California and Nevada.]

The month began with unsettled weather that was followed thru the first decade by fair weather. The second decade of the month was unsettled and unusually cold. Very high northwest winds were frequently reported along the coast from Point Reyes northward.—*A. G. McAdie, Professor and District Forecaster.*

PORTLAND, OREG., FORECAST DISTRICT.†  
[Oregon, Washington, and Idaho.]

The month was marked by excessive cloudiness and unseasonably low temperature. On the 1st warnings were issued for a storm that past over the district on the 2d. Light frosts were of frequent occurrence but were of a local character, except on the 13th, 17th, and 23d, when they were general over the eastern portion of the district.—*L. Lodholz, Local Forecaster, temporarily in charge.*

#### RIVERS AND FLOODS.

The morning weather map of May 21 showed a depression over western Texas, and a moderate high area over the lower Missouri Valley. During May 22 and 23 the depression moved slowly eastward over southern Texas, and relatively high pressure continued to the northeastward and eastward. On the morning of May 24 the Texas depression had about disappeared, but there was another over northern New Mexico, with a high area over Lake Superior. During the 22d heavy rains fell in the Texas Panhandle, Oklahoma, and the extreme northern portion of eastern Texas. These heavy rains continued during the night of the 22d and extended into the upper watersheds of the Brazos and Trinity rivers, 4.44 inches falling at Abilene, Tex., during the night of the 22–23d. More heavy rains fell in Oklahoma and that portion of the Red River Valley immediately to the southward, continuing during the night of the 23d at an excessive rate, and extending thruout Texas generally. During the twenty-four hours ending at 8 a. m., May 24, the precipitation over eastern Texas ranged from 1½ to over 6 inches. On the morning of the 25th there was a well-defined depression over the Dakotas and Nebraska, and the rains in Texas had ceased. The following map (fig. 1) shows the amount and distribution of the rainfall over the State of Texas from May 21 to 24, inclusive.

Such torrential downpours could have but one result, and the floods that followed were the greatest and most destructive ever recorded in the history of the State of Texas. Over the watershed of the Colorado River the rainfall was not as heavy as over the watersheds of the Brazos and Trinity rivers, and the rise in the former river was not important except below Austin. At Columbus the maximum stage was 33.8 feet on the 30th, 9.8 feet above the flood stage, but no flood stages were reported from places any considerable distance above.

Owing to the excessive rate at which the rain fell on the 23d the first rush of flood waters in the Brazos and Trinity rivers came very suddenly. At Kopperl, on the Brazos River, 60 miles above Waco, the gage reading on the morning of May 23 was only 1.2 feet, but by the morning of the 24th it

\* Morning forecasts made at district center; night forecasts made at Washington, D. C.

† Morning and night forecasts made at district center.