

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.

Acknowledgment is also made of the specific cooperation of the following chiefs of independent, local, or governmental services: R. F. Stupart, Esq., Director of the Meteorological Service of the Dominion of Canada; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Señor Camilo A. Gonzales, Director-General of Mexican Telegraphs; Capt. S. I. Kimball, General Superintendent of the United States Life-Saving Service; Commandant Francisco S. Chaves, Director of the Meteorological Service of the Azores, Ponta Delgada, St. Michaels, Azores; Dr. W. N. Shaw, Director of the Meteorological Office, London; Maxwell

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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.

From the Plains States to the Atlantic coast January was unusually dry until the closing days of the month. In the Rocky Mountain districts snowfalls were exceptionally heavy. West of the Rockies there was an excess of precipitation that over western Oregon and a greater portion of California amounted to 5 to 15 inches.

The first decade of January was very cold from the Great Lakes westward to the Pacific, and from the upper Missouri Valley westward the average temperature for this period was 15° to 25° below the seasonal average, with absolute minimum readings 30° to 55° below zero in Montana. From North Dakota to Washington and in northern Oregon the cold exceeded any previous record for the same period.

The following are among many comments that were made by the press regarding warnings issued in connection with a severe cold wave that swept the country from the Rocky Mountains to the Atlantic during the first decade of the month:

Kansas Farmers' Star, Wichita, Kans., January 8, 1909.

The weather man gave the farmers of the Southwest plenty of warning. There can't be any very good excuse for not having provided shelter for their live stock.

Market Growers' Journal, Louisville, Ky., January 16, 1909.

* * * This cold wave was forecast in a special bulletin sent out by the Weather Bureau Saturday afternoon, January 2. This forecast indicated the coldest weather of the season for States east of the Mississippi River and was issued in ample time to warn all growers who needed the warning. * * *

Post-Express, Rochester, N. Y., January 5, 1909.

* * * Hundreds of shippers are holding back shipments on warnings from the Weather Bureau and many shipments were rushed following the warning sent out last week. The absolute accuracy of the two special forecasts made by the Weather Bureau at Washington has aroused much favorable comment among business men here and in some instances have saved thousands of dollars for nurserymen and brewers.

Daily Times-Union, Jacksonville, Fla., January 11, 1909.

* * * The point of interest involved in the forecast is the fact that nine days ago the Washington office announced the existence of conditions that favored cold wave formation, and on Monday and Tuesday the

same office gave notice that the cold wave actually existed in the Northwest, and that the extreme cold would reach the seaboard States during the last of the week, which was exactly the case, for on Friday the temperature in the middle Atlantic section was about 15° above zero, and freezing prevailed over the south Atlantic section.

The merit of such long range weather predictions lies in the fact that they enable shippers to meet contingencies; for instance, the Florida shipper of fish knows that no re-icing will be necessary, and the banana shipper from Mobile and New Orleans provides the necessary warmth for his cars. Other commodities to interior points are given the necessary attention.

During the second and a great portion of the third decade of the month the weather was unusually mild generally over the United States, and from the 23d to 25th maximum readings equaled the record at numerous points from the middle and southern Rocky Mountain slope to the Atlantic coast. During the last few days of the month a storm moved eastward from the middle Rocky Mountain region to New England attended from the lower Missouri Valley eastward by the severest weather of the present season, and followed by a cold wave that carried the line of freezing temperature as far south as the middle Florida Peninsula.

The Times, Tampa, Fla., of February 1, 1909, refers editorially as follows to warnings issued in connection with this cold wave:

The Weather Bureau gave ample warning so that persons who desired and were prepared could "fire" their groves and shelter their seed beds and avoid any loss whatever. The value of the Bureau is made more evident every year by the saving it enables people to make in defending themselves against cold and storms.

BOSTON FORECAST DISTRICT.*

[New England.]

Temperature was near or slightly above normal and over the greater portion of the district precipitation was somewhat in excess of the normal, with average snowfall in northern and a deficiency of snowfall in southern portions. The only severe storm of the month occurred on the 29-30th, when severe gales swept the coast. There were no storms without warnings. Cold-wave warnings were issued on the 6th and 15th.—
J. W. Smith, District Forecaster.

NEW ORLEANS FORECAST DISTRICT.*

[Louisiana, Texas, Oklahoma, and Arkansas.]

Temperature was above normal and precipitation was deficient thruout the district. Storm warnings issued on two dates were justified and no general storm occurred without warnings. Cold waves occurred in some parts of the district from the 5th to 7th, 9th to 12th, and on the 29th and 30th, for which warnings were issued for portions of the district, and warnings for all frosts and freezing temperatures that occurred in the sugar and trucking regions were issued.—*I. M. Cline, District Forecaster.*

LOUISVILLE FORECAST DISTRICT.*

[Kentucky and Tennessee.]

Temperature averaged above and precipitation was below normal. From the 20th to 28th temperature was remarkably high, while the last two days were quite cold with minimum temperatures about zero, and high winds and snow. Cold-wave warnings were issued on the 4th, 5th, 6th, 10th, and 29th in advance of decided changes to colder.—*F. J. Watz, District Forecaster.*

CHICAGO FORECAST DISTRICT.*

[Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas, and Montana.]

The severest cold wave of the present season advanced over the district from the 4th to 6th with temperature 20° to 30° below zero in the northwestern States and zero temperature as far south as southern Kansas and a minimum of 9° below zero at Chicago. This was the lowest temperature recorded at Chicago in nearly four years. Timely warning was given to all sections of the approach of the cold wave. The second cold wave of the month crost the district from the 10th to 12th. This cold wave had covered the northwestern States for several days and warning of its advance over the eastern portion of the district was given. A disturbance that crost the district on the 13th and 14th was followed by a cold wave in the more northern States. In this instance warnings were issued somewhat beyond the southern limits of the cold wave. Following a disturbance that moved eastward over British America during the 15th and 16th there was a period of mild temperature that culminated on the 23d with a maximum of 65° at Chicago, this being the highest January temperature recorded at that station since 1876. The weather continued mild and fair until the 28th when a storm advanced from Kansas eastward over the district attended by general precipitation, gales, and a decided fall in temperature. In connection with this storm warnings of gales were sent to open ports on Lake Michigan, heavy snow warnings to lower Michigan, forecasts of decidedly colder weather to northwestern States, and cold-wave warnings for southern and eastern portions of the district.—*E. B. Garrriott, Professor and District Forecaster.*

DENVER FORECAST DISTRICT.*

[Wyoming, Colorado, Utah, New Mexico, and Arizona.]

Except in northeastern Wyoming, temperature was much in excess of the normal. At intervals heavy precipitation occurred in the Plateau and Rocky Mountain districts, and in the Rocky Mountain districts snowfall was the heaviest in January since 1895. A storm that occurred on the 28th was notably severe and was accompanied by high wind that drifted the snow and interfered seriously with mountain railroads. The cold waves of the month were erratic in movement and were accurately forecast.—*F. H. Brandenburg, District Forecaster.*

In a letter to the district forecaster at Denver dated February 3, 1909, Mr. Howard Gamble, of Sheridan Lake, Colo., states that three persons at that place owe their lives to the prompt and reliable cold-wave warnings issued by the Weather Bureau during the present winter.

SAN FRANCISCO FORECAST DISTRICT.†

[California and Nevada.]

The month as a whole was one of the stormiest experienced

on this coast in many years. The rainfall was unusually heavy and continued thruout a longer period of time than any of which there is a record since January, 1849. At San Francisco, in a record covering sixty years, the total rainfall has exceeded that of the present month but three times—in 1862, 1866, and 1878. In the number of rainy days, however, the present year breaks all records, as there were 26, the average number of rainy days in January being 11. In the first decade of the month heavy rains in the valleys and melting snow in the mountains caused floods, and on the 11th killing frost occurred. Following this date storms continued practically until the end of the month, causing floods and washouts, and near the close of the month railroad communication in almost every part of the State was seriously interrupted. Storm-warnings were ordered on 19 dates.—*Alexander G. McAdie, Professor of Meteorology.*

PORTLAND, OREG., FORECAST DISTRICT.†

[Oregon, Washington, and Idaho.]

The weather was unusually stormy. Cold north to east winds continued with scarcely any interruption from the 4th to 15th, attended by heavy snow as far west as the coast line. Rivers froze that had not been frozen for many years, and the cold was intense from British Columbia to the sea. The break in the cold spell was followed by a succession of low-pressure areas that were attended by heavy rains, high winds, and mild temperatures that resulted in a breaking up of ice in the rivers. The smaller streams became bank full and the lower portion of the Willamette River was above flood stage for several days. Storm-warnings were ordered for all important storms of the month.—*E. A. Beals, District Forecaster.*

RIVERS AND FLOODS.

There were no great floods during the month except in California, and as these continued with a brief intermission, until after the end of the month their description will be delayed until the February issue of the MONTHLY WEATHER REVIEW.

Owing to the warm weather, the ice in the Hudson River at Troy and Albany, N. Y., moved out late in the afternoon of the 25th, and by the morning of the 26th there was a considerable rise in the river to within about 2 feet of the flood stages. Warning of the probable breaking of the ice and the high water was issued on the morning of the 25th.

The same general conditions prevailed in the upper watershed of the North Branch of the Susquehanna River, and the ice moved out on the morning of the 25th. Warning of the coming warm weather and rains, with consequent high water, was issued on the 21st and again on the 22d and 23d, and on the morning of the 25th the river at Binghamton, N. Y., reached a stage of 10.8 feet, 3.2 feet below the flood stage. The damage amounted to between \$3,000 and \$4,000, and was confined principally to the loss of a portion of the first ice crop.

Nothing of interest occurred along the other rivers, except that the rains of the 5th and 6th over the upper Ohio watershed caused a barge stage at Pittsburg, permitting the coal fleet to start southward with about 15,000,000 bushels of coal that had been awaiting this opportunity for several months.

Navigation at St. Louis, Mo., was suspended on the 1st on account of low water.

The use of the new river gage at Knoxville, Tenn., began on January 1, 1909. The zero of this gage is set at the same elevation as that of the old gage, but owing to differences in the channel at the old and new locations, the readings above the zero mark do not agree exactly, and at a stage of 16 feet on the new gage the reading on the old gage will be 17.7 feet. It is not thought that the difference (1.7 feet) will be much greater above the 16-foot mark and comparative readings will be made as soon as the first high water arrives.

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

† Morning and night forecasts made at district center.