Gulf States and in small areas in Missouri, Illinois, Iowa, Michigan, and West Virginia. Many other sections from the Plains States eastward had moderate amounts, yet interspersed in nearly every region were small areas with less than 2 inches of precipitation, while a large section extending from central Texas to northern Kansas had less than 1 inch during the entire month. From the Rocky Mountains westward, except in portions of northern Idaho and Montana, there was less than half an inch of precipitation, and in considerable portions of central and southern California rain was entirely absent as usual.

RELATIVE HUMIDITY.

For the month, as a whole, the relative humidity east of the Mississippi River was generally above the normal, except in Florida, the Lake Region, and the southern portion of the Middle Atlantic States, where it was below the average. Likewise the month was relatively damper than usual in the northern border States west of the Mississippi River and from the Rocky Mountain region westward, save in Wyoming and portions of Idaho, where it was drier. In the Central and Southern Plains States, the relative humidity for the month averaged considerably below the normal. Much of this area of deficient relative humidity also experienced unusually hot, dry, weather throughout the month, which was rendered more bearable because of the low humidity which obtained, and few heat prostrations were reported.

GENERAL SUMMARY.

The weather for August, 1916, was characterized by continuous hot weather in much of the interior of the country east of the Rocky Mountains during the first two decades, but the closing days of the month showed a marked contrast to this condition. The month was unusually dry in Oklahoma, Kansas, Iowa, and portions of the adjoining States, which resulted in much damage to growing crops, especially to corn, but at the same time afforded an opportunity for harvesting and thrashing the small grain crops and for haying. From the Rocky Mountains westward the weather for the month presented no unusual features, except that in the north Pacific Coast States, especially Washington, August was an unusually dry month.

SEVERE STORMS.

The following notes of severe storms have been extracted from reports by officials of the Weather Bureau:

Texas.—A tropical storm of great intensity passed inland over the lower Texas coast between Brownsville and Corpus Christi on August 18, 1916. The center of the storm appears to have entered the State a little south of Riviera—about 45 miles southwest of Corpus Christi—moved rapidly northwestward nearly parallel to the Rio Grande, and dissipated in the Pecos Valley. The storm caused the loss of 20 lives, so far as known, and an estimated property damage of $1,600,000. Much open cotton was beaten to the ground and immense damage was done to dwellings, churches, windmills, and other structures. The towns of Corpus Christi, Kingsville, and Bishop were perhaps the greatest sufferers, but frame houses were damaged and windmills blown down as far north as Montell, Uvalde County.

Utah.—A tornado occurred on the Sevier River, August 5. (See detailed account on p. 459.)

Average accumulated departures for August, 1916.

Districts.	Temperature.			Precipitation.			Cloudiness.		Relative humidity.	
	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure from the normal.	General mean for the current month.	Departure from the normal.
	°F.	°F.	°F.	In.	In.	In.	P. ct.		P. ct.	
New England	68.4	+1.3	− 6.3	1.87	−2.00	−1.20	4.4	−0.6	81	−1
Middle Atlantic	74.1	+1.3	+ 6.5	2.20	−2.20	−2.20	4.5	−0.6	75	−1
South Atlantic	79.1	+1.3	+ 9.2	4.25	−1.90	−7.70	5.1	−0.1	81	−1
Florida Peninsula	81.6	−0.3	− 2.1	7.97	+1.00	−7.10	5.3	+0.1	78	−1
East Gulf	80.4	+1.2	+ 6.6	3.59	−1.20	0.00	4.9	−0.3	79	−1
West Gulf	82.4	+1.3	+10.8	3.00	0.00	−3.50	4.8	+0.8	73	−2
Ohio Valley and Tennessee	76.5	+2.1	+ 2.2	3.23	−0.20	−0.30	4.9	+0.4	75	+3
Lower Lakes	72.5	+2.9	− 0.2	2.29	−0.70	−1.00	3.7	−0.9	68	−3
Upper Lakes	69.5	+3.2	+ 1.9	2.60	−0.30	+1.20	4.3	−0.4	73	−2
North Dakota	66.2	−0.5	−14.0	2.49	+0.20	+1.00	4.0	0.0	70	−6
Upper Mississippi Valley	75.6	+2.7	+ 4.1	3.25	+0.70	−1.20	4.3	+0.1	71	+1
Missouri Valley	75.8	+2.0	+ 3.8	3.48	+0.10	−5.30	4.1	0.0	69	+2
Northern slope	65.8	−1.0	− 9.7	1.33	+0.10	+0.10	3.8	−0.1	58	+6
Middle slope	77.1	+1.9	+ 4.8	1.85	−0.60	−3.40	4.0	+0.2	60	+1
Southern slope	78.5	−0.6	+15.8	4.14	+2.00	−3.10	4.0	+0.1	60	−1
Southern Plateau	75.4	−1.9	− 0.5	1.06	0.00	+1.10	3.4	−0.3	50	+8
Middle Plateau	68.9	−2.7	− 2.5	0.90	+0.20	+0.40	2.6	−0.7	40	+7
Northern Plateau	69.7	−0.7	−14.5	0.76	+0.40	+2.20	2.6	+0.3	43	0
North Pacific	62.6	+0.7	− 7.1	0.24	−0.60	−4.30	4.5	−0.1	76	+9
Middle Pacific	64.5	−0.3	+ 0.1	0.12	+0.10	+0.60	3.4	−0.2	61	−6
South Pacific	69.2	−1.3	− 0.6	0.02	0.00	+4.50	2.5	−0.3	68	+2

WEATHER CONDITIONS ON THE NORTH ATLANTIC DURING AUGUST, 1915.

The data presented are for August, 1915, and comparison and study of the same should be in connection with those appearing in the REVIEW for that month.

Chart IX (XLIV-92) shows for August, 1915, the averages of pressure, temperature, and the prevailing direction of the wind at 7 a. m., 75th meridian time (Greenwich Mean Noon), together with the locations and courses of the more severe storms of the month.

PRESSURE.

The average pressure for the month, as shown on Chart IX, was remarkable for its weak gradients, and lack of any well-developed HIGHS or LOWS. While the Azores HIGH is shown on Chart IX as near its usual position it was of less intensity and of greater extent than usual. The area usually occupied by the continental HIGH was covered by a comparatively uniform pressure of about 30 inches. The Icelandic LOW was apparently shallow, although the center was too far north to come within the limits of the chart. The mean monthly barometric readings ranged from 29.86 inches in the waters adjacent to the Scandinavian Peninsula to 30.14 inches in the vicinity of the Azores, a variation considerably less than normal. Although the range in average pressure was unusually small the variation from day to day in some localities was quite marked. North of the 50th parallel and west of the 30th meridian the pressure was considerably above the monthly average during the first two and last three days of the month; it was lower than usual from the 5th to the 8th, and about the average during the remaining 22 days. Over the northeastern part of the ocean there were marked negative pressure departures during the first and last decades of the month, while between the 30th and 50th parallels the variations from the normal were comparatively small during those

periods. The West Indian hurricane that prevailed in the Caribbean Sea and Gulf of Mexico from August 10 to 17 was responsible for low pressures in the immediate vicinity of the limited storm areas, although the monthly averages were affected but little, being but slightly below the normal in that territory.

GALES.

The northern waters were remarkably free from winds of gale force, and north of the 50th parallel they occurred on only one day, in three 5° squares. Off the coast of France gales were reported on the 1st and 2d, the remainder of the month being free, while between the 20th and 30th parallels there were none reported during the month. The West Indian hurricane in the Caribbean Sea and Gulf of Mexico caused an increase in the number of gales occurring in that territory. They were reported in different 5° squares on from one to three days, the latter number being somewhat above the normal. From August 1 to 3 a LOW (shown as Track II, Chart IX, for July, XLIV–84) was central near the Irish Channel. On August 4 this had moved about 10° eastward and was fast filling in, so that no sign of it existed on the 5th. From August 3 to 10 a low area prevailed between the 40th and 55th parallels and the 20th and 40th meridians, the movement from day to day being slow and irregular. On August 4 the barometer had fallen to 29.59 inches from 29.80 inches on the 3d, and on the 5th and 6th the lowest readings were approximately 29.35 inches, the center on these days being near latitude 48° N., longitude 37° W. Light to moderate winds prevailed during the greater part of the period, although on the 6th winds of 40 miles an hour were reported by three vessels. By August 7 the center had moved about 5° in an east-north-east direction, the barometer falling to 29.28 inches, and although the area of low pressure had decreased in extent no heavy winds were reported. On the 8th the depression had moved slightly toward the west; the pressure had changed but little since the previous day and the velocity of the wind had increased somewhat. The LOW then moved about 10° in an easterly direction, and on the 9th was central near latitude 51° N., longitude 26° W. It had increased somewhat in intensity and the isobars had assumed a more definite outline, although the force of the wind remained about the same. The depression then moved toward the north, and on the 10th was near latitude 55° N., longitude 27° W., the conditions of wind and weather having changed but little since the previous day. It then began to fill in and by the 11th had practically disappeared.

On the 10th a LOW central near the Barbados marked the beginning of the severe West Indian hurricane that prevailed until the 23d. This storm (track 1 on Chart IX) was fully discussed by Prof. H. C. Frankenfield in a special bulletin on the subject and also in the MONTHLY WEATHER REVIEW for August, 1915. The positions of this storm as shown on Chart IX of this issue were plotted from the daily synoptic charts from the 10th to the 17th, while from the 18th to the 23d they were copied from Chart III, the tracks of centers of low areas for August, 1915 (M. W. R., XLIII–86). The intense character of this hurricane, as shown by its steep barometric gradients, was specially noticeable on the 17th, when the 8 a. m. barometer reading at Houston, Tex., was 28.72 inches; at Galveston, Tex., 29.12 inches; and in the Gulf of Mexico about 150 miles east of Galveston, 29.70 inches.

From August 12 to 14 a LOW of slight intensity was central near the north coast of Ireland, accompanied by light to moderate winds. By the 15th this shallow depression had moved about 10° toward the east and covered practically the same area on the 16th. It continued in a slow and irregular eastward movement, without increasing in intensity, and on the 17th, 18th, and 19th occupied the southern part of the Scandinavian Peninsula, while by the 20th it had passed beyond the limits of the chart. On the 17th a LOW appeared in the Gulf of St. Lawrence that remained practically stationary until the 21st, when it began to fill in. This depression was also of slight intensity. On the 17th and 18th fog prevailed off the banks of Newfoundland. From the 21st to the 25th the atmospheric conditions were unusually stagnant, the pressure being somewhat above the normal, with small gradients and light wind movement. On August 26 a LOW of 29.50 inches was central near Cape Whittle, Canada; this probably moved toward the north, as it did not appear on the chart of the 27th. Nearly normal conditions prevailed during the remainder of the month, and no depressions of any consequence were reported.

TEMPERATURE.

North of the 40th parallel and east of the 30th meridian the mean monthly temperature was from 1° to 3° above the normal, while nearly the same conditions held true in the southeastern part of the ocean, although there were a few 5°-squares in this territory where the temperatures were slightly lower than usual. Between the 35th and 40th parallels and 30th and 65th meridians the departures ranged from −1° to −4°, while in the waters adjacent to the American coast the temperatures varied but little from the normal.

The temperature departures for August, 1915, at a number of Canadian and United States Weather Bureau stations on the Atlantic and Gulf coasts were as follows:

	°F.		°F.
St. Johns, Newfoundland	−1.4	Norfolk, Va.	+1.3
Sydney, C. B. I.	+1.0	Hatteras, N. C.	+1.7
Halifax, N. S.	+0.8	Charleston, S. C.	+1.7
Eastport, Me.	−1.5	Key West, Fla.	+0.7
Portland, Me.	−2.4	Pensacola, Fla.	+0.2
Nantucket, Mass.	−1.0	New Orleans, La.	+1.7
New York, N. Y.	−1.8	Galveston, Tex.	−1.3
Washington, D. C.	−0.5	Corpus Christi, Tex.	+1.7

The lowest temperature reported during the month was 46°F., occurring on the 7th, 8th, and 9th, in the 5°-square between latitudes 55–60° N. and longitudes 40–45° W.

The highest temperature in this square was 56°F., and occurred on a number of days in the last decade of the month.

The extreme monthly range of temperature was, as a rule, small, the extreme range for any 5°-square being 10 degrees.

FOG.

During the period from 1901 to 1906 for the month of August the average percentage of days with fog off the banks of Newfoundland was from 40 to 45, while in the same region for August, 1915, fog was observed on from 7 to 10 days, with a percentage of from 23 to 32. The amount in the vicinity of Nantucket Island was also somewhat below the normal; east of the 40th meridian along the northern steamer routes, the percentage was never higher than 6, while the normal varies from 5 to 10.

PRECIPITATION.

No hail or snow was reported during the month.

Maximum wind velocities during August, 1916.

[Velocities below 50 mi./hour (22.4 m./sec.) are not included.]

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Mis./hr.				*Mis./hr.*	
Corpus Christi, Tex.	18	90	e.	Norfolk, Va.	23	53	nw.
Del Rio, Tex.	19	60	se.	Pensacola, Fla.	8	52	sw.
El Paso, Tex.	12	57	se.	Point Reyes Light, Cal.	4	61	nw.
Evansville, Ind.	26	77	sw.	Do.	17	67	nw.
Jacksonville, Fla.	11	52	s.	Do.	18	60	nw.
Louisville, Ky.	26	54	nw.	San Antonio, Tex.	19	56	se.
Mobile, Ala.	6	63	ne.	Sand Key, Fla.	1	50	se.
Mount Tamalpais, Cal.	3	64	nw.	San Juan, P. R.	22	92	ne.
Do.	13	55	w.	Do.	29	62	ne.
Do.	16	50	nw.	Sioux City, Iowa.	6	70	sw.
Do.	17	66	nw.	Do.	9	60	w.
Do.	24	61	nw.	Syracuse, N. Y.	22	56	sw.
Do.	31	57	nw.	Washington, D. C.	27	52	nw.