

TABLE 2.—Free-air resultant winds (m. p. s.) during May, 1926

Altitude, m. s. l.	Broken Arrow, Okla. (233 meters)				Due West, S. C. (217 meters)				Ellendale, N. Dak. (444 meters)				Groesbeck, Tex. (141 meters)				Royal Center, Ind. (225 meters)				Washington, D. C. (34 meters)	
	Mean		8-year mean		Mean		6-year mean		Mean		9-year mean		Mean		8-year mean		Mean		8-year mean		Mean	
	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.
Surface	S. 13°W.	3.1	S. 12°E.	1.7	S. 79°W.	1.6	W.	0.5	N. 5°W.	0.5	N. 14°E.	0.4	S. 18°W.	3.6	S. 11°E.	2.0	S. 61°W.	1.7	N. 82°W.	0.2	N. 28°W.	0.7
250	S. 10°W.	3.4	S. 12°E.	1.8	S. 75°W.	2.1	S. 80°W.	0.6	N. 9°W.	0.5	N. 26°E.	0.2	S. 15°W.	3.8	S. 7°E.	2.6	S. 66°W.	1.9	S. 78°W.	0.3	N. 40°W.	2.3
500	S. 24°W.	4.5	S. 2°E.	2.5	S. 82°W.	3.9	S. 85°W.	1.3	N. 8°W.	0.2	S. 14°W.	5.0	S. 3°S.	3.8	S. 67°W.	3.3	S. 65°W.	1.2	N. 40°W.	2.3	N. 40°W.	2.3
750	S. 23°W.	4.4	S. 6°W.	2.9	S. 85°W.	4.8	S. 84°W.	1.9	N. 8°W.	0.2	S. 14°E.	0.4	S. 15°W.	5.4	S. 8°W.	4.3	S. 84°W.	3.9	S. 74°W.	1.8	N. 50°W.	3.6
1,000	S. 33°W.	4.6	S. 21°W.	3.0	S. 85°W.	5.0	S. 88°W.	2.4	N. 11°W.	0.1	S. 24°W.	0.7	S. 24°W.	5.5	S. 20°W.	4.7	N. 85°W.	4.6	S. 85°W.	2.4	N. 42°W.	4.7
1,250	S. 38°W.	4.4	S. 36°W.	3.2	S. 84°W.	6.5	S. 80°W.	3.5	S. 26°W.	0.7	S. 24°W.	1.0	S. 29°W.	5.3	S. 27°W.	4.9	N. 77°W.	5.1	N. 84°W.	2.9	N. 39°W.	6.0
1,500	S. 45°W.	4.4	S. 47°W.	3.6	S. 79°W.	7.0	S. 78°W.	4.6	S. 31°W.	1.0	S. 36°W.	1.4	S. 35°W.	4.5	S. 36°W.	4.6	N. 82°W.	5.7	N. 86°W.	3.2	N. 42°W.	7.9
2,000	S. 54°W.	4.8	S. 64°W.	4.1	S. 78°W.	8.7	S. 80°W.	6.0	S. 69°W.	3.0	S. 58°W.	2.5	S. 56°W.	4.0	S. 49°W.	4.6	N. 80°W.	6.1	N. 89°W.	5.6	N. 50°W.	8.7
2,500	S. 66°W.	4.4	S. 82°W.	5.0	S. 76°W.	12.4	S. 82°W.	8.0	S. 75°W.	4.4	S. 64°W.	5.3	S. 59°W.	5.0	S. 63°W.	5.0	N. 80°W.	6.5	N. 84°W.	6.5	N. 67°W.	9.5
3,000	S. 68°W.	4.9	N. 87°W.	5.7	S. 77°W.	14.1	S. 80°W.	8.1	S. 70°W.	5.8	S. 71°W.	5.3	S. 72°W.	7.1	S. 76°W.	6.2	N. 87°W.	7.7	N. 74°W.	6.9	N. 68°W.	8.7
3,500	S. 69°W.	5.3	N. 81°W.	7.1	S. 80°W.	14.6	S. 85°W.	9.6	S. 68°W.	7.4	S. 78°W.	6.0	S. 87°W.	9.0	S. 86°W.	7.4	S. 7°W.	3.8	N. 72°W.	7.0	N. 67°W.	8.4
4,000	S. 65°W.	8.5	N. 83°W.	8.0	N. 68°W.	21.0	N. 74°W.	11.4	S. 87°W.	11.5	N. 87°W.	7.9	S. 84°W.	11.4	N. 75°W.	9.8	S. 45°W.	4.5	N. 85°W.	6.4	N. 55°W.	10.0
4,500	S. 67°W.	7.6	N. 79°W.	8.8					N. 57°W.	12.4	N. 68°W.	6.2									N. 43°W.	11.6
5,000	S. 17°W.	6.4	W.	6.4																	N. 26°W.	13.6

TABLE 1.—Free-air temperatures, relative humidities, and vapor pressures during May, 1926

Altitude, m. s. l.	TEMPERATURE (°C.)										PRESSURE AND WINDS												
	Broken Arrow, Okla. (233 meters)		Due West, S. C. (217 meters)		Ellendale, N. Dak. (444 meters)		Groesbeck, Tex. (141 meters)		Royal Center, Ind. (225 meters)		*Washington, D. C. (7 meters)		Mean										
	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 9-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean	
Surface	20.7	+1.2	19.9	-0.4	17.0	+3.5	22.2	-0.3	17.2	+0.7	15.6												
250	20.6	+1.2	19.6	-0.4	16.4	+3.3	21.3	-0.3	17.0	+0.8	14.8												
500	19.3	+1.7	17.6	-0.1	14.4	+3.0	19.6	-0.2	15.2	+1.5	14.2												
750	17.9	+1.9	15.9	0.0	14.4	+3.0	18.0	-0.4	14.2	+2.3	13.1												
1,000	16.5	+1.6	14.3	-0.1	13.1	+3.2	17.0	-0.1	13.0	+2.6	11.6												
1,250	15.1	+1.4	12.6	-0.3	12.1	+3.6	16.0	-0.2	11.6	+2.7	10.2												
1,500	13.5	+1.1	11.1	-0.4	10.6	+3.6	15.0	-0.1	10.1	+2.7	9.0												
2,000	10.4	+0.7	7.7	-1.1	7.6	+3.6	12.2	-0.5	7.7	+2.2	6.7												
2,500	7.5	+0.5	5.3	-0.8	4.3	+3.3	9.7	-0.3	5.5	+3.2	4.1												
3,000	4.3	+0.3	2.5	-0.8	1.0	+2.9	6.6	-0.6	2.9	+3.4	1.3												
3,500	1.0	+0.1	-0.9	-2.3	-2.5	+2.2	3.6	-0.6	0.3	+3.7	-2.0												
4,000	-1.9	+0.3	-5.1	-2.3	-6.5	+1.8	0.5	-0.7	-3.5	+2.7	-5.2												
4,500	-4.7	+0.3			-10.2	+1.0					-8.3												
5,000	-7.1	+0.2									-10.9												

Altitude, m. s. l.	RELATIVE HUMIDITY (%)											
	Broken Arrow, Okla. (233 meters)		Due West, S. C. (217 meters)		Ellendale, N. Dak. (444 meters)		Groesbeck, Tex. (141 meters)		Royal Center, Ind. (225 meters)		*Washington, D. C. (7 meters)	
	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 9-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean
Surface	64	-6	61	-1	51	-9	73	+2	64	+2	74	
250	64	-6	61	-1	51	-9	74	+2	64	+2	69	
500	61	-8	60	-3	51	-9	74	+1	62	0	62	
750	60	-8	60	-4	52	-7	75	+3	60	-2	59	
1,000	59	-8	60	-4	52	-7	70	+1	61	-1	60	
1,250	58	-7	61	-3	50	-9	65	0	61	-1	62	
1,500	58	-5	62	-2	50	-9	59	-2	61	-1	64	
2,000	54	-6	62	0	50	-9	54	0	58	-1	65	
2,500	53	-4	53	-6	49	-9	47	-4	49	-5	63	
3,000	54	-1	50	-5	49	-7	49	-1	43	-7	61	
3,500	53	-2	54	+3	56	+3	43	-5	45	-6	64	
4,000	50	-6	62	+15	57	+5	45	-5	69	+19	63	
4,500	48	-6			61	+8					58	
5,000	54	-6									58	

Altitude, m. s. l.	VAPOR PRESSURE (mb.)											
	Broken Arrow, Okla. (233 meters)		Due West, S. C. (217 meters)		Ellendale, N. Dak. (444 meters)		Groesbeck, Tex. (141 meters)		Royal Center, Ind. (225 meters)		*Washington, D. C. (7 meters)	
	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 9-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean	Mean	De- part- ure from 8-year mean
Surface	15.67	-0.69	13.82	-1.08	9.58	+0.25	19.57	+0.11	12.82	+0.95	13.18	
250	15.52	-0.59	13.55	-1.09	9.36	+0.27	18.77	+0.09	12.60	+0.95	11.57	
500	13.75	-0.44	11.96	-1.10	8.37	+0.42	16.93	-0.01	10.95	+0.96	10.06	
750	12.58	-0.20	10.70	-1.10	8.37	+0.35	15.52	+0.17	9.81	+0.92	8.98	
1,000	11.55	-0.16	9.79	-0.98	7.70	+0.42	13.55	-0.07	9.21	+1.15	8.30	
1,250	10.41	-0.14	8.97	-0.86	7.07	+0.38	11.63	-0.24	8.54	+1.24	7.81	
1,500	9.37	+0.08	8.16	-0.77	6.46	+0.38	9.82	-0.45	7.90	+1.34	7.44	
2,000	8.92	-0.47	6.28	-0.98	5.32	+0.40	7.50	-0.27	6.63	+1.52	6.48	
2,500	6.56	-0.25	4.30	-1.52	4.21	+0.32	5.55	-0.68	4.85	+1.06	5.11	
3,000	4.53	-0.10	3.17	-1.40	3.30	+0.26	4.47	-0.70	3.91	+1.22	3.97	
3,500	3.48	-0.31	2.35	-1.26	2.90	+0.56	2.71	-1.42	3.55	+1.35	3.24	
4,000	2.66	-0.46	1.32	-1.47	2.11	+0.34	1.81	-1.62	3.70	+2.11	2.47	
4,500	2.07	-0.45			1.59	+0.23					1.53	
5,000	1.93	-0.43									1.13	

* Naval Air Station.

THE WEATHER ELEMENTS

By P. C. DAY, In Charge of Division

The most important feature of the weather was the marked absence of important cyclones and anticyclones. Pressure changes were frequent, but they were usually of small degree, and barometric depressions that in their early formation gave promise of developing into storms of wide extent frequently contracted their areas as they moved eastward, lost their important cyclonic characteristics, and failed to influence materially the weather along their paths.

In the absence of extensive cyclonic storms there was an important deficiency in precipitation over the central and eastern districts and drought more or less severe prevailed to a wide extent, though moderately cool weather over eastern and southern districts prevented as serious injury to growing vegetation as would have resulted had severe heat accompanied the dry weather as is frequently the case.

The precipitation from these poorly developed cyclones was mainly light, and usually coincident only over comparatively small areas, though locally heavy in a few instances.

Important precipitation occurred in the lower Mississippi Valley on the 2d and 3d. In southern Louisiana the falls were unusually heavy, particularly in the vicinity of New Orleans, where more than 9 inches fell in less than 10 hours and nearly 7 inches in about 3 hours. Precipitation on these dates covered much of the Mississippi Valley region, and during the following day extended over most eastern districts, though the falls were mainly light.

Rather extensive precipitation, though mostly light, overspread the Great Plains and western Mountain districts from the 7th to 9th, extending into the Mississippi Valley and southeastern States on the 10th and 11th, where the amounts were mainly larger, reaching an inch or more in portions of the middle Gulf States.

Widely scattered though mainly light precipitation occurred from the upper Mississippi Valley southeastward to the Atlantic coast from the 14th to 16th, and thence northeastward along the coast during the 16th and 17th, the amounts increasing to the northward and ranging up to 3 inches or more at points in New Jersey and southern New England.

More or less precipitation was rather general from the central valleys to the Atlantic coast about the 18th to 23d, attending the passage eastward of several small barometric depressions. During this period there were local heavy rains in the Florida Peninsula and adjacent Gulf and south Atlantic coast districts, and beneficial showers in the upper Mississippi Valley and Great Lakes region.

The latter part of the month had little precipitation except locally over northern districts between the Great Lakes and Rocky Mountains, but at the close there were rather extensive showers from the Missouri Valley south-eastward to the lower Mississippi Valley and thence north-eastward over the Ohio Valley and Middle Atlantic States.

Anticyclones were mainly unimportant to eastward of the Rocky Mountains, but usually reached their greatest development over a somewhat narrow area from the upper Lakes southeastward to the Florida Peninsula. West of the Rocky Mountains anticyclonic conditions were rather persistent over the Pacific Coast States and their influence extended generally over the Southwest.

The average pressure for the month was below normal from the Missouri Valley and adjacent portions of the Canadian Northwest southeastward to Florida, and over all districts in both the United States and Canada to eastward, the greatest deficiency occurring in the far north-eastern portions.

From the Rocky Mountains and lower Mississippi Valley westward the average pressure was everywhere greater than normal, though the excess was not large over any area.

Compared with April the average pressure was lower over all districts in both the United States and Canada, save in the far West where there was a slight increase over the April values. Usually pressure is lower in May than in April over all parts of both countries save for a small area in eastern New England and the adjacent portions of the Maritime Provinces, but the decrease is usually small. During May, 1926, the average pressure over the interior portions of the United States was much lower than in the preceding month.

The distribution of pressure favored cool, northerly winds over the Northeastern States, but they were mainly from southerly points in the Gulf States and central valleys, and from westerly points near the Pacific coast.

Destructive winds were mainly local and no great damage or important loss of life was reported from that cause. Damage by hail, however, was extensive, as these storms occurred on many different dates and over widely separated districts, the greatest damage probably occurring in Texas, where from the 8th to 10th and on the 18th hail was widespread and caused damage estimated at nearly \$3,000,000, mostly to growing crops. Extensive damage from hail was sustained in Sutter County, Calif., where the peach crop was injured to the extent of \$250,000. Severe losses from hail and wind were sustained in portions of Kansas and Oklahoma. The details concerning severe storms will be found at the end of this section.

TEMPERATURE

The tendency toward lower than normal temperatures over eastern and southern districts, so persistent during the two months preceding, continued through much of May, though the area of decided coolness was far smaller than in the preceding months, being confined largely to the more northeastern and extreme southern districts.

On the other hand, the unusual heat that has marked the weather over much of the western half of the country since January continued through May, the heated area extending into the central valleys, which had not been the case to any large extent during the two preceding months.

Day to day changes in temperatures were mainly small, important variations being confined chiefly to the more northern sections and occurring mostly during the first few days. The daily range in temperature, however, was frequently large, notably on the 1st near the western end of Lake Superior where there was a rise of 52° in a few hours. In general the daily range was large in many of the central-northern districts due to high percentage of clear sky, affording opportunity for the maximum insolation during the day and rapid cooling at night. At points in the upper Mississippi Valley the average daily range was the greatest of record for any month of the year.

There were but few instances of monthly means or extremes of temperature surpassing those in May of other years, though Sioux City, Iowa, had the warmest May in nearly 40 years, and at San Diego, Calif., it was the warmest May in more than 50 years save one, 1885. Maximum temperatures during the latter part of the month at several points in the Great Plains were the highest observed in May during 50 years or more.

In portions of California and the far Northwest the three months, March to May, inclusive, constitute the warmest similar period of record, and in much of the same area the average monthly temperatures have been in excess of the normal for the past 6 months.

The continued high temperature in portions of the Northwest since the first of the year is probably without precedent in that region both as to length of time with temperature nearly continuously above normal, and the extent of the departure. At Havre, Mont., of the 151 days from January 1 to May 31, only 23 days had temperature below normal, and the average excess for that period has been 9.4° per day. Of the 23 days with temperature below normal 15 occurred during a cool period from March 25 to April 8, inclusive; aside from this the temperature has been almost continuously above normal for the entire period.

The most important warm periods were mainly toward the end of the month, notably from the 26th to 28th in the Gulf States and portions of near-by areas, on the 29th in the Middle Plains and in the Southwest on the 30th and 31st. In portions of the Middle and North Atlantic States the maximum temperature occurred on the 2d, and in parts of the upper Mississippi Valley as early as the 1st.

The lowest temperatures were well scattered through the month, but mostly from the 3d to 5th in the eastern half of the country, about the 7th to 10th in the Southwest and on the 14th and 15th in the Middle Plains.

Temperatures below freezing were observed as far south as western North Carolina, in the mountains of Tennessee and Arkansas, and to the northern border of Oklahoma. In the Mountain States of the West, temperatures as low as 10° were reported from exposed points.

The average temperature continued below normal to a considerable degree over the Northeastern States, as has been the case since February inclusive, and it continued moderately cool in the South as was the case in March and April. In the far West temperature continued above the normal as has been the case since the first of the year and also in the upper Missouri Valley, which area has likewise been above normal for the greater part of the present year so far. In the central valleys the month was decidedly warm.

PRECIPITATION

As has been the case during most of the months of the present year to date, precipitation was widely deficient and particularly so over the interior, eastern and most southern districts, where a general lack of rain has persisted for several months, and conditions approaching severe drought were existing in many localities, particularly in the Southeastern States, where locally it was the driest May of record.

On the other hand, the rainfall was generous for the season in Arizona, New Mexico, and generally over Colorado, Utah, and Wyoming, where the warm season rainfall began unusually early. There were also some decidedly heavy falls locally in southern Louisiana, eastern Texas, near the Black Hills region of South Dakota, and in the far Northwest.

SNOWFALL

Light snow fell in northern New England on the 8th and 9th, the depths reaching as much as 2 inches locally in Maine. There was also snow over the upper Michigan peninsula and adjacent areas of Wisconsin, amounting to as much as 5 inches in extreme northern portions. Elsewhere there was little or no snow save in the western mountains. In Colorado snow was fairly heavy in the

higher mountains, reaching a depth of 30 inches locally, and there were depths up to a foot or more at points in California. Otherwise the snowfall in the mountains was mainly light.

ICE IN THE GREAT LAKES

Owing to the continued cool weather over the Lake region the ice melted slowly, and due to westerly winds accumulated, as stated in April, to an unusual extent in the eastern end of Lake Erie. At Buffalo, N. Y., the conditions attending the opening of navigation were the worst ever known, and it was not until May 9 that navigation was finally opened, and this was accomplished only after laborious efforts on the part of the big steel freighters in breaking their way through the heavy ice fields.

RELATIVE HUMIDITY

The percentages of relative humidity were almost universally less than normally shown for May, only scattering stations reporting values above normal.

The deficiencies were particularly large over the eastern half of the country and moderately so over most western districts, though there was a moderate excess over portions of the far Southwest where rainy weather prevailed to a considerable extent.

SEVERE LOCAL HAIL AND WIND STORMS, MAY, 1926

The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the Annual Report of the Chief of Bureau.

Place	Date	Time	Width of path, yards ¹	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Beaver City, Nebr.....	1		880		\$750	Hail.....	Damage principally to early gardens.....	Official, U. S. Weather Bureau.
Howard County, Nebr. (northwest part of).	1	4:30 p. m.	3 mi.		500	do.....	Many early gardens ruined; windows broken. Path 20 miles.	Do.
Alva, Okla., and vicinity.....	2	do.....	8 mi.			Heavy hail.....	Severe damage to growing crops over path 18 miles long.	Do.
Custer County, Okla. (west part of).	2	7 p. m.....	2,640		15,400	do.....	Crops injured.....	Do.
Milwaukee, Wis., and vicinity.	2	P. m.....			1,000	Thundersquall.....	Plate glass windows broken; signs, awnings and etc., damaged.	Do.
Minnehaha District, Clarke County, Wash.	4	10:30 a. m.	50		3,000	Tornadic wind.....	A number of small buildings razed, others damaged. Many fruit trees injured. Path 2 miles long.	Do.
Bend, Calif.....	4	5:30 p. m.	2,640		8,000	Wind.....	Young turkeys and chickens killed; other property damage.	Do.
Red Bluff, Calif. (north and east of).	4	6-9 p. m.				Hail.....	About 600 sheep lost due to exposure from storm.	Do.
Antelope Valley, Tehama County, Calif.	4	7:15 p. m.	5 mi.		10,000	Hail and rain.....	Crops beaten, roads washed, 1,100 sheep drowned; damage to fruit not estimated.	Do.
Miami, Fla. (near).....	5	P. m.....				do.....	Several small buildings under construction blown down.	Do.
Grady County, Okla. (southeast part of).	6	do.....	4 mi.		4,000	Hail.....	Crops injured.....	Do.
San Juan, P. R. (vicinity of).....	6	8:19 p. m.		1		Thunderstorm and heavy hail.	Many paper-covered roofs damaged; trees and shrubs stripped, some broken or uprooted; a man killed by live wire.	Do.
Elgin, Tex.....	7	A. m.....	3,520		5,000	Hail.....	Crops and buildings damaged. Path 2 miles long.	Do.
Taylor, Tex.....	7	do.....	5 mi.		30,000	do.....	Crops severely injured.....	Do.
Okmulgee, Okla. (3 miles north of).	7	1:30 p. m.	880		100,000	Tornado.....	Considerable property damage; slight injury to crops; 23 persons injured.	Do.
Sutter County, Calif.	7	2:30 p. m.	3 mi.		250,000	Hail.....	Extensive damage to peaches.....	Do.
Bokoshe, Okla. (2 1/2 miles north of).	7	6 p. m.....	880	3	56,400	Tornado and hail.	Crop damage about \$16,000; property considerable.	Do.
Shreveport, La. (25-50 miles south of).	7-8					Hail.....	Cotton and corn considerably damaged necessitating some replanting.	Do.
Boynton, Okla. (6 miles northeast of).	8	2:30 p. m.	100		6,500	Tornado.....	Some property damaged in oil field.....	Do.
Cimarron and Texas Counties, Okla.	8	2-3 p. m.				Hail.....	Crops damaged.....	Do.
Clarence, La. (near).....	8	3 p. m.	440-1,760			do.....	Young crops severely injured.....	Do.
Remus, Okla.....	8	do.....			1,000	Wind.....	Character of damage not reported.....	Do.
Garvin County, Okla. (south-central part of).	8	4 p. m.	4 mi.		100,000	Severe hail.....	Crop loss heavy; other damage about \$25,000.....	Do.
Meade to Fratt County, Kans	8	5-8 p. m.	2-8 mi.		350,000	do.....	Damage chiefly to wheat over path 85 miles long.	Do.
Dallas, Tex., and vicinity.....	8	6 p. m.	1-15 mi.		875,000	do.....	Public utilities companies suffer heavy losses; much damage to crops, buildings, and other property.	Do.
Strong City to Cotton Wood Falls, Kans.	8	7 p. m.	5-8 mi.		3,000	do.....	Path short; damage principally to window glass and automobile tops.	Do.

¹ "Mi." signifies miles instead of yards.