

THE WEATHER OF THE MONTH.

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PRESSURE AND WINDS.

The distribution of the mean atmospheric pressure for February, 1909, over the United States and Canada is graphically shown on Chart VI, and the average values and departures from the normal are shown for each station in Tables I and III.

The average atmospheric pressure for the month was marked by several unusual features which influenced in a marked degree the weather of the month. The most pronounced feature was an unusual grouping of high-pressure areas over the southern districts, especially over the Gulf and South Atlantic States, and a marked absence of such areas over the interior and northern districts.

Areas of low pressure moved in rapid succession over the interior portions of the country, frequently from the Pacific to the Atlantic coasts, and while pursuing courses well to the south over the Mountain and Plains regions, they recurved sharply to the northeast while still west of the Mississippi River and moved to the Atlantic coast by way of the Ohio Valley, Lake region, and New England, bringing much cloudy, rainy weather to those districts, but leaving the east Gulf and South Atlantic States remarkably free from storm activity.

The pressure for the month was slightly above the normal near the south Atlantic and Gulf coasts, and from Texas westward to the Pacific, but over all other districts of the United States and Canada the average for the month was below the normal, being most pronounced in the interior districts where under normal conditions high pressure prevails during the winter months.

As compared with the previous month the pressure diminished rapidly from the Pacific coast eastward. Over the Pacific coast the average pressure exceeded that for January from 0.05 to 0.15 inch, while over the districts from the Rocky Mountains eastward the pressure ranged from 0.10 to 0.20 inch less than that for January. With the highest average pressure over the Gulf States and the Southwest, and low pressure over the interior and northern districts, the prevailing winds from the upper Mississippi Valley southwestward to Texas, and eastward over all districts to the Atlantic coast were from the south, carrying the moisture and warmth of the Gulf region far to the north and modifying the weather of the month accordingly.

The frequent passage of extensive areas of low pressure over the interior districts prevented any decided stagnation in the atmospheric circulation, and the month, as a whole, showed the wind movement decidedly above the average.

TEMPERATURE.

The month opened with high barometric pressure and generally cold weather over the districts east of the Mississippi, but with moderate temperatures over all western districts. The cold weather of the 1st and 2d penetrated to the Gulf coast, and killing frosts occurred over the greater part of northern and central Florida.

Generally moderate temperatures for the season prevailed over all districts from the 2d to the 8th, when a decided cold wave appeared over the northern Rocky Mountain districts and moved east and southeast during the 9th and 10th, but with diminished intensity. Moderate weather again prevailed till about the 13th, when another high-pressure area covered the upper Mississippi Valley, which by the 15th had developed into a cold wave of considerable severity over the districts between the Rocky Mountains and the Mississippi River with temperatures below the freezing point in extreme southern Texas. It moved eastward over the Ohio Valley, east Gulf and South Atlantic States with decreasing severity during the 16th and 17th, and moderate weather as to tem-

perature prevailed over most districts during the remainder of the month.

The mean temperature of the first ten days was above the normal from 5° to 10° over all districts except eastern Maine, the southern coast of California, and at a few points near the Gulf coast. During the second decade the mean temperature continued above the normal in all districts except the upper Missouri Valley and the northern Rocky Mountain district. It was unusually warm over the Ohio Valley, Appalachian Mountains, and middle Atlantic coast regions, where the mean for the 10-day period averaged from 6° to 14° above the normal.

During the last decade of the month the mean temperature was also above the normal by substantial amounts over all districts, except locally in the southern portions of the Rocky Mountain and Plateau districts.

Over the greater portion of the Mississippi and Ohio valleys, lower Lakes, and Middle Atlantic States, the mean temperature for the month ranged from 5° to 10° above the normal, and over the northern portion of the Plateau region it ranged from 4° to 8° above.

Despite the unusual warmth prevailing during most of the month the minimum temperatures of the 1st and 2d over the east Gulf States and Florida Peninsula, and those of the 14th and 15th over Texas and portions of the west Gulf States, were unusually low, and freezing temperatures occurred over all portions of the Southern States, except extreme southern Florida and at a few points in the southern coast district of Texas. Over the Pacific coast States freezing temperatures did not occur in southwestern Arizona and the lower elevations of central California, and the immediate coast districts from southern California to northern Washington were exempt from frost.

Minimum temperatures from 20° to 30° below zero occurred in the mountain regions of Wyoming and Montana and thence eastward to the upper Lakes, and at points in northern New England, and at a few points in northern Montana and northern Minnesota temperatures from 36° to 48° below zero were recorded.

PRECIPITATION.

The month was one of generally heavy and well-distributed precipitation over most of the interior districts, the storm areas moving with unusual regularity and persistence across the entire country from the Pacific to the Atlantic, and generally farther south than usual over the territory west of the Mississippi. These storm areas were frequently of wide extent and accompanied by heavy rains over the Pacific coast States, heavy snows in the mountain districts of the West, and by heavy rain, sleet, and snow in the middle Mississippi and Ohio valleys, Lake region, and New England. A very heavy sleet storm prevailed over the Ohio Valley, Lake region, northern portion of the Middle Atlantic States, and New England during the 14th to the 16th, doing much damage to trees, electric wires, etc. Heavy rains over the watershed of the Ohio River during the 22d to the 24th caused high waters in many of the streams in that region, and floods of considerable proportions prevailed in the main stream and some of its larger tributaries at the end of the month. High waters also prevailed in the rivers of northern California, due to heavy rains and melting snows over the surrounding watersheds.

Precipitation continued below the normal amount in Texas as in January, and rain was needed over much of that State. The month was also comparatively dry over most of the southern portions of the cotton-growing States, the rainfall being especially light over the Florida Peninsula. Over the Pacific coast precipitation was generally heavy and rain fell almost

daily during a large portion of the month. Over large portions of California, Oregon, and Washington precipitation was heavy and of almost daily occurrence from the 1st to the 25th. In portions of California precipitation was of almost daily occurrence from January 1 to February 25, inclusive, probably one of the longest periods of nearly continuous rainfall in the history of the State, and with amounts probably greater than ever recorded during a similar period of time.

As a result of severe storms in northwestern Arkansas during the last decade of the month thirteen persons were killed and considerable damage was done to property. Destructive windstorms occurred also in portions of eastern Texas, in Oklahoma, and at points in New Jersey.

SNOWFALL.

The general distribution of the snowfall during the month is shown on Chart VII, from which it appears that appreciable amounts of snow occurred in all portions of the country, except near the south Atlantic coast, over the greater part of the Gulf States including most of Texas, and the lower elevations of Arizona and California, and along the immediate Pacific coast.

Amounts from 15 to 20 inches or more occurred over northern New England, and the Adirondack regions of New York, over the greater parts of Michigan, Wisconsin, and Minnesota and in parts of northern Iowa, eastern Nebraska, and South Dakota.

Over the mountain districts of the West the amounts varied generally with the elevation, small amounts being recorded at the lower elevations, while in the high ranges much heavier falls occurred.

In general, the snowfall over all the mountain States was above the normal, except in portions of Washington, Idaho, and Montana, where the amount was generally less than the average. The greatest falls appear to have occurred in the Sierras of California, where the amounts for the month ranged from 5 to more than 10 feet at the higher elevations. Heavy snows were also general in Colorado and Wyoming, the maximum depths approaching closely those reported from California.

The snow-covered portions of the United States at the end of the month are shown on Chart VIII. Deep snow covered the interior of New England and portions of northern New York, and the ground was generally well covered in the upper Lake region and from central Iowa and eastern South Dakota northward.

But little snow remained on the ground over the Great Plains region or in the valleys of the mountain districts of the West. In the high mountains, however, there appeared to be an unusual amount of snow and it was generally reported as being in excellent condition to furnish an abundant supply of water until late in the season.

HUMIDITY AND SUNSHINE.

The relative humidity ranged from 5 to 25 per cent less than the normal over the Great Plains from Kansas southward over Texas and eastern New Mexico, and it was also below the normal by smaller amounts from the above districts eastward to the Atlantic. There were also small areas in the middle and northern Plateau districts with relative humidity below the average.

The relative humidity was unusually high over the upper Missouri Valley and in portions of California and Nevada, and it was generally above the normal from the upper Mississippi Valley eastward to New England, and also in most of the mountain districts of the West.

The month was one of much cloudy weather over the upper Ohio Valley, Lake region, upper Mississippi Valley, and over the northern portion of the Plateau and Pacific coast districts,

where generally less than 30 per cent of the possible sunshine was received, and at a few points the amount was less than 20 per cent of the possible.

Over the South Atlantic and east Gulf States and the Florida Peninsula there was ample sunshine, as also over the Great Plains from western Nebraska to Texas and generally over the Southwest.

In Canada.—Director R. F. Stupart says :

The mean temperature of February was above the normal in the more southerly portions of all the Provinces and below the normal in the northern portions. This was especially pronounced in Alberta where in the south the positive departure was about 2°, while in the north the negative departure was from 5° to 7°; also in Ontario where in the south-western counties the positive departure was from 6° to 8°, while in the upper Ottawa Valley the negative departure was 3°. The contrast between south and north was less pronounced in the Maritime Provinces than elsewhere, with the greatest excess of the average 2° at St. John.

The precipitation was considerably in excess of the average in Ontario and over the larger portion of Quebec, while in the Maritime Provinces and also in the West, departures from average were not pronounced in either direction. The most striking feature was probably the large rainfall in the St. Lawrence Valley, heavy rains having occurred on several days. In Ontario and the Maritime Provinces days of rain and snow were nearly equally divided.

At the close of the month the ground was generally snow covered throughout Canada, but the amount varied considerably with the district.

A depth of about 1 inch near the Bay of Fundy increased northward to about 60 inches over the greater portion of Quebec, and in the Cariboo district of British Columbia there was about 40 inches on the ground. In other portions of Canada the depth varied between a trace and 15 inches. Since the beginning of March, however, the Peninsula of Ontario has been covered with snow to a depth of from 3 to 8 inches.

On the 1st of March reports from the Gulf of St. Lawrence showed that the ice was closely packed from Anticosti to the Magdalen Islands, while between the latter place and Cape St. Lawrence there was a heavy open ice field.

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
New England	12	28.9	+ 2.9	+ 5.1	+ 2.6
Middle Atlantic	16	40.4	+ 6.1	+10.1	+ 5.0
South Atlantic	10	52.2	+ 4.2	+ 9.2	+ 4.6
Florida Peninsula*	8	62.4	+ 5.6	+11.0	+ 5.5
East Gulf	11	53.0	+ 2.1	+ 7.2	+ 3.6
West Gulf	10	53.2	+ 2.0	+ 8.9	+ 4.4
Ohio Valley and Tennessee	13	41.8	+ 5.6	+10.1	+ 5.0
Lower Lake	10	29.2	+ 4.7	+ 8.9	+ 4.4
Upper Lake	12	22.5	+ 3.5	+ 6.8	+ 3.4
North Dakota*	9	31.8	+ 2.5	+ 1.1	+ 0.6
Upper Mississippi Valley	15	30.2	+ 5.6	+ 9.0	+ 4.5
Missouri Valley	12	29.3	+ 5.4	+ 8.1	+ 4.0
Northern Slope	9	24.3	+ 2.8	+ 2.1	+ 1.0
Middle Slope	7	36.6	+ 4.2	+ 7.7	+ 3.8
Southern Slope*	4	47.1	+ 4.7	+ 9.0	+ 4.5
Southern Plateau*	12	42.7	+ 1.8	+ 3.0	+ 1.5
Middle Plateau*	10	29.2	+ 0.1	+ 6.5	+ 3.2
Northern Plateau*	12	34.8	+ 4.6	+ 2.3	+ 1.2
North Pacific	7	42.0	+ 1.3	+ 3.0	+ 1.5
Middle Pacific	8	49.4	+ 0.2	+ 3.1	+ 1.6
South Pacific	4	52.4	+ 0.2	+ 2.3	+ 1.2

* Regular Weather Bureau and selected cooperative stations.

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	6.2	+ 0.7	Missouri Valley	5.2	- 0.2
Middle Atlantic	6.2	+ 0.6	Northern Slope	5.7	+ 0.9
South Atlantic	4.2	- 1.1	Middle Slope	4.1	- 0.3
Florida Peninsula	3.8	- 0.8	Southern Slope	4.0	- 0.8
East Gulf	4.9	- 0.6	Southern Plateau	3.8	+ 0.8
West Gulf	4.3	- 1.5	Middle Plateau	5.6	+ 0.8
Ohio Valley and Tennessee	6.3	+ 0.1	Northern Plateau	7.8	+ 1.1
Lower Lake	7.3	+ 1.0	North Pacific	8.2	+ 1.2
Upper Lake	7.6	+ 1.3	Middle Pacific	6.6	+ 1.8
North Dakota	6.4	+ 1.3	South Pacific	5.9	+ 1.8
Upper Mississippi Valley	6.1	+ 0.8			

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		<i>Inches.</i>		<i>Inches.</i>	<i>Inches.</i>
New England.....	12	5.06	155	+ 1.8	+ 2.2
Middle Atlantic.....	16	3.43	106	+ 0.2	- 0.5
South Atlantic.....	10	3.36	83	- 0.7	- 2.8
Florida Peninsula*.....	8	1.27	41	- 1.8	- 2.6
East Gulf.....	11	6.11	127	+ 1.3	- 1.8
West Gulf.....	10	2.12	78	- 0.6	- 3.2
Ohio Valley and Tennessee.....	13	6.27	173	+ 2.7	+ 1.7
Lower Lake.....	10	4.16	169	+ 1.7	+ 2.0
Upper Lake.....	12	2.47	148	+ 0.8	+ 0.4
North Dakota*.....	9	0.33	62	- 0.2	- 0.4
Upper Mississippi Valley.....	15	2.81	164	+ 1.1	+ 1.2
Missouri Valley.....	12	1.51	150	+ 0.5	+ 0.5
Northern Slope.....	9	0.82	100	0.0	0.0
Middle Slope.....	6	0.68	87	- 0.1	- 0.5
Southern Slope*.....	7	0.33	32	- 0.7	- 1.6
Southern Plateau*.....	12	0.93	90	- 0.1	- 0.1
Middle Plateau*.....	10	1.25	119	+ 0.2	+ 1.2
Northern Plateau*.....	12	1.43	108	+ 0.1	+ 1.2
North Pacific.....	7	7.45	137	+ 2.0	+ 3.8
Middle Pacific.....	8	7.53	192	+ 3.6	+ 10.5
South Pacific.....	4	4.04	159	+ 1.5	+ 6.3

* Regular Weather Bureau and selected cooperative stations.

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England.....	74	- 1	Missouri Valley.....	75	0
Middle Atlantic.....	73	- 1	Northern Slope.....	72	+ 1
South Atlantic.....	70	- 6	Middle Slope.....	57	- 10
Florida Peninsula.....	78	- 2	Southern Slope.....	45	- 22
East Gulf.....	69	- 7	Southern Plateau.....	54	+ 7
West Gulf.....	68	- 6	Middle Plateau.....	66	+ 3
Ohio Valley and Tennessee.....	74	0	Northern Plateau.....	71	- 5
Lower Lake.....	81	+ 1	North Pacific.....	85	+ 4
Upper Lake.....	83	+ 1	Middle Pacific.....	84	+ 8
North Dakota.....	89	+ 9	South Pacific.....	76	+ 7
Upper Mississippi Valley.....	80	+ 3			

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Atlanta, Ga.....	5	52	w.	New York, N. Y.....	10	70	w.
Do.....	7	52	nw.	Do.....	11	50	w.
Block Island, R. I.....	10	52	s.	Do.....	26	73	w.
Do.....	11	53	w.	Norfolk, Va.....	10	53	sw.
Do.....	20	52	sw.	North Head, Wash.....	1	54	se.
Do.....	25	70	nw.	Do.....	4	66	se.
Buffalo, N. Y.....	1	50	sw.	Do.....	5	72	s.
Do.....	6	60	sw.	Do.....	8	56	se.
Do.....	10	66	sw.	Do.....	14	76	se.
Do.....	11	52	w.	Do.....	15	72	se.
Do.....	17	54	sw.	Do.....	16	60	se.
Do.....	24	60	sw.	Do.....	17	60	se.
Canton, N. Y.....	6	72	w.	Do.....	18	71	se.
Cleveland, Ohio.....	6	58	sw.	Do.....	19	68	s.
Do.....	25	52	w.	Do.....	28	54	s.
Columbus, Ohio.....	24	58	w.	Oklahoma, Okla.....	4	50	sw.
Detroit, Mich.....	10	56	w.	Do.....	5	54	n.
Duluth, Minn.....	9	60	ne.	Pittsburg, Pa.....	6	54	w.
Do.....	10	54	nw.	Point Reyes Light, Cal.....	1	63	s.
Do.....	24	54	nw.	Do.....	2	75	s.
Eastport, Me.....	16	50	ne.	Do.....	4	56	s.
El Paso, Tex.....	4	58	w.	Do.....	6	52	s.
Do.....	8	55	sw.	Do.....	7	56	nw.
Do.....	21	57	sw.	Do.....	12	68	s.
Fort Smith, Ark.....	13	52	nw.	Do.....	18	52	nw.
Hatteras, N. C.....	7	51	nw.	Do.....	20	78	nw.
Do.....	8	50	nw.	Do.....	21	82	nw.
Do.....	25	53	nw.	Do.....	23	50	s.
Kansas City, Mo.....	14	52	ne.	Do.....	24	53	s.
Lincoln, Nebr.....	9	58	nw.	Providence, R. I.....	25	60	nw.
Little Rock, Ark.....	5	52	nw.	Richmond, Va.....	10	61	sw.
Memphis, Tenn.....	5	58	w.	Do.....	24	50	s.
Milwaukee, Wis.....	9	55	e.	Stouls City, Iowa.....	9	53	nw.
Mount Tamalpais, Cal.....	4	50	s.	Southeast Farallon, Cal.....	1	51	s.
Do.....	7	50	sw.	Do.....	2	62	s.
Do.....	11	54	sw.	Do.....	11	51	se.
Do.....	12	50	sw.	Do.....	12	53	sw.
Do.....	19	60	nw.	Do.....	20	53	nw.
Do.....	20	58	nw.	Do.....	21	64	nw.
Do.....	21	64	nw.	Syracuse, N. Y.....	6	54	sw.
Mount Weather, Va.....	1	58	nw.	Tatoosh Island, Wash.....	12	62	e.
Do.....	6	52	nw.	Do.....	15	54	e.
Do.....	20	50	nw.	Do.....	18	52	sw.
Do.....	24	53	nw.	Do.....	19	60	sw.
Do.....	25	58	nw.	Toledo, Ohio.....	6	57	sw.
Nantucket, Mass.....	20	53	sw.	Do.....	10	50	sw.
New York, N. Y.....	6	58	w.	Vicksburg, Miss.....	14	62	nw.