

WEATHER, FORECASTS, AND WARNINGS FOR THE MONTH.

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A series of barometric depressions of unusual intensity passed eastward from the Atlantic Ocean over the British Isles to Europe and thence to Siberia from the 1st of the month until the 18th, after which date the pressure fluctuations over these regions were of moderate intensity. These disturbances caused heavy and continued rains over practically the whole of Europe and floods in the rivers of France and Germany. Gales were frequent and destructive off the west coast of Europe and over the Mediterranean Sea. During this period the pressure changed decidedly from day to day over eastern Siberia, and, except from the 1st to 3d, it was decidedly above the normal in the Icelandic area. The Atlantic area of high pressure during the time of the stormy weather over Europe was ill defined and unsteady, as shown by the daily reports from the Azores. The Bering Sea low was south of its normal position during the first two decades of the month, and a number of violent storms were reported from the southern coast of Alaska; in the interior of Alaska, the pressure ruled high and unusually low temperatures for the season prevailed. High pressure again set in over Alaska following the 23d, which was preceded by abnormally low pressure from the 19th to 22d. Abnormally high pressure prevailed over the interior of Asia from the 13th to the close of the month, and from the 25th to the 30th it was above 31 inches. The highest pressure reported was 31.52 inches at Ekaterinburg on the 26th.

In the United States the temperature for the month was below normal from the Mississippi Valley eastward, while to the westward it was above normal. In California and in the region from the Plains States eastward precipitation was generally below normal for the season, except in scattered localities; elsewhere precipitation was above the normal, in portions of Oregon being as much as 4 inches in excess. In the Central Valleys precipitation ranged from 1 to 4 inches less than normal.

The following forecast was issued Sunday, October 30:

A general reaction to higher temperature is indicated for the eastern half of the country during the next three days, and moderate temperature will continue over the Eastern and Southern States thereafter until the close of the week. A disturbance will reach the Pacific States by Tuesday, pass eastward over the Middle West during the middle of the week and reach the Atlantic States by Friday. This disturbance will be attended by unsettled weather and rains, and it will be followed by lower temperature. Except for a short period of unsettled weather and rains attending this disturbance, the weather will be generally fair during the week.

A distance of moderate intensity appeared in the Northwest at the close of October and moved thence to the St. Lawrence Valley by the night of the 2d, attended by rain and snow in the Great Lakes region, the Ohio Valley, and the Middle Atlantic and New England States. On the night of the 2d, a disturbance began to develop off the South Atlantic coast, whence it moved northward, and on the 3d its center was off the New Jersey coast and on the 4th off Cape Cod. This disturbance caused heavy precipitation on the 3d and 4th in the Middle Atlantic and New England States, and there were heavy snows in the interior of New York, Pennsylvania, and the District of Columbia the night of the 3d. Storm warnings were ordered displayed at ports on the Atlantic coast from Cape Hatteras northward at 1 p. m. of the 3d, and high winds followed over the region where warnings were displayed; the highest wind velocity reported was 56 miles an hour on the 4th at Block Island. No wrecking of vessels was reported as a result of this disturbance. In connection with the development of this storm off the coast, the following extract from a report by Prof. A. J. Henry, executive officer in charge of the Mount Weather Observatory, is of interest:

The abnormal direction of the wind observed in yesterday's (the 3d) kite flight was communicated to the forecast division in the following telegram:

"The winds in the kite flight at Mount Weather, Va., Thursday, up to an altitude of about 2 miles were northerly. Above that elevation southerly winds prevailed, so that the upper kites flew in a direction exactly opposite to those lower down, a situation not hitherto developed at this station." A recent study of the synchronous pressure fluctuations at Pikes Peak and Colorado Springs, Colo., shows that the pressure often continues to fall at the upper station after it has begun to rise below; also, that the cold, northerly winds which follow in the rear of a "low" are generally shallow and that they do not always extend to the top of the mountains directly west of the Springs. The winds at Mount Weather on Wednesday at some distance aloft were from the southwest and strong; indeed, five kites and about 18,000 feet of wire were carried away. These winds were doubtless blowing in response to the strong barometric gradient afforded by the disturbance that was passing down the St. Lawrence Valley. Thursday morning a flight was started in northwest winds which extended upward at least 2 miles; above the stratum of lower air moving from the northwest was a deep stratum of rather light southerly winds which extended well into the cirrocumulus level, as indicated by the clouds. It may be argued from analogy with the Pikes Peak records, that the upper winds had not appreciably changed their direction since the day previous and that only the lower winds had changed direction. It is becoming apparent, from the kite observations at this station, that changes in the direction of the lower winds (from 1 to 2 miles above the surface) take place before they do aloft.

Following this disturbance the temperature fell considerably in the Southern and Eastern States and frosts occurred as far south as northern Florida.

The following weekly forecast was issued Sunday, November 6:

During the first half of the week the weather over the districts east of the Rocky Mountains will be generally fair, except that light rain or snow will fall Monday and Tuesday over the Great Lakes region and Monday night or Tuesday in northern New York and New England, attending a disturbance that will move along the northern border from the extreme Northwest. This disturbance will be followed by cooler weather in the Northwestern States, the upper Mississippi Valley, and the Lake region Monday and Tuesday. Another disturbance will appear on the Pacific coast Monday or Tuesday and move eastward, crossing the Middle West Wednesday or Thursday and the Atlantic States Friday or Saturday. This disturbance will be preceded by rising temperature and attended by unsettled weather, with rains on the Pacific coast and in the Southern States and rain or snow in northern districts; it will be followed by considerably colder weather.

A storm appeared in the Northwest on the 8th and moved eastward and reached the St. Lawrence Valley on the 11th, attended by general precipitation during its movement eastward, and high winds and snows in the Great Lakes region and later off the Middle Atlantic coast. Warnings of these conditions were issued well in advance of their occurrence.

The following is an editorial that appeared in the Cleveland News of November 18:

The recent long-continued gales were not characterized by notable loss of life on the Great Lakes. * * * This result is said to have been due to increased caution on the part of vessel managers, increased respect for storm warnings, and increased reluctance to take chances for profit. These conditions may be the 1910 navigation to an end unmarred by calamities like those of 1909.

The following forecast was issued Sunday, November 13:

A disturbance that is developing in the Southwest will move eastward, crossing the Mississippi and Ohio Valleys and the Lake region Monday night and Tuesday and the Eastern States Tuesday or Wednesday; this disturbance will be preceded by rising temperature and attended by unsettled weather with snow in Northern and local rains in Middle and Southern States from the Mississippi Valley to the Atlantic coast. It will be followed by considerably colder weather in the Southern and Southwestern States by Monday night and Tuesday. Another disturbance will appear on the north Pacific coast Monday or Tuesday; it will cause rains in the Pacific States, and during its passage eastward over the Northern States it will be preceded by rising temperature, attended by unsettled weather and rain or snow in the northern half of the country. This disturbance will reach the Atlantic States Friday, and it will be followed by a change to colder weather, the change to colder first appearing in the Northwest Thursday or Friday, whence it will move eastward and southward over much of the country east of the Rocky Mountains.

Following the disturbance that passed up the St. Lawrence Valley on the 11th, pressure remained abnormally low over the Canadian Maritime Provinces and westerly gales continued until the 17th off the North Atlantic coast and strong

west and northwest winds with snow prevailed over the Great Lakes and the interior of the Atlantic States until the 16th. From the 8th to the 18th temperatures ruled below normal over practically all parts of the country, except on the Pacific coast, where normal conditions obtained. Rains continued over the North Pacific States from the 7th to the 11th and again set in over these States on the 17th, following the appearance of an area of low barometric pressure in the Bering Sea area. This area of low barometric pressure moved to the Middle Rocky Mountain region on the 18th, and the area of rains and snows extended to the Upper Missouri Valley on that day. The pressure continued low for several days over the Gulf of Mexico, and on the morning of the 19th a well-defined disturbance appeared over the northeastern portion of the Gulf of Mexico, and there were general rains in the east Gulf and South Atlantic States. At 10 a. m. of the 19th, northeast storm warnings were ordered for the Atlantic coast from Jacksonville to Wilmington. On the 20th the center of this disturbance had moved to a position a considerable distance off the south Atlantic coast, and the brisk and high northeast winds on the Carolina and Georgia coasts had diminished and become northwesterly.

The following weekly forecast was issued Sunday, November 20:

Following a prolonged period of low temperatures throughout the region east of the Rocky Mountains, the general pressure distribution over the Northern Hemisphere is such as to indicate a general reaction to higher temperature over the greater part of the country during the next several days. A disturbance that is now over Alaska will move eastward and reach the Atlantic States during the latter part of the week. This disturbance will cause rains in the North Pacific States during the first part of the week, and during the latter part of the week it will cause unsettled weather and probably local rains or snows over the northern districts east of the Rocky Mountains.

The disturbance that developed over the western Plateau region on the 18th moved eastward attended by light rains and snows over the region west of the Rocky Mountains on the 18th and from the 19th to 22d over the northern districts east of the Rocky Mountains. On the 19th a marked fall in temperature set in over the Bering Sea area and southern Alaska and an offshoot from this depression appeared on the north Pacific coast on the night of the 20th attended by rains and strong winds, warnings of which were issued on the morning of the 20th. On the 21st the center of this disturbance was over Alberta and on the 22d over Manitoba; on these dates rain continued in the northern Rocky Mountain region and the North Pacific States and the temperature increased decidedly in advance of the storm center. The storm on the 23d was over Lake Superior and there were rains and snows the night of the 22d over the Upper Mississippi Valley and the Upper Lake region. Storm warnings were displayed the morning of the 23d on Lake Erie and at 2 p. m. on Lakes Huron and Ontario. This disturbance continued its eastward movement over the Great Lakes, attended by a considerable area of precipitation and preceded by a marked change to warmer weather. With a continuation of low pressure over Alaska and the north Pacific Ocean, rains continued in the Pacific States, the Northern Plateau region and the northern Rocky Mountain region, and storm signals were again displayed on the north Pacific coast on the 21st, and on the 22d were extended southward to the northern California coast. The center of disturbance on the 23d was over British Columbia, whence it moved eastward to the Upper Mississippi Valley on the 24th and to the New England coast on the 25th. This disturbance was attended by rains from the Upper Mississippi Valley eastward over the Lake region, the Ohio Valley, and the Middle Atlantic and New England States, and forecasts for high northwest winds were issued for the North Atlantic coast. On the 24th another dis-

turbance moved inland over northern California and on the 25th its center was over the Northern Plateau region, and rains were general in the Pacific States and snow fell in the northern Rocky Mountain region. On the morning of the 24th storm warnings were displayed in connection with this storm on the northern California coast. On the morning of the 26th the disturbance was over the eastern slope of the Rocky Mountains and storm warnings of high easterly winds were issued for Lakes Michigan and Superior, and on the afternoon of the 26th they were extended to Lakes Huron and Erie. This disturbance moved directly eastward and on the morning of the 27th its center was over Illinois.

The following weekly forecast was issued Sunday, November 27:

The international weather charts prepared daily at the central office of the Weather Bureau indicate that during the coming week a series of storms of marked intensity will cross the United States and that temperature changes preceding and following these disturbances will be decided. A disturbance that now covers the Mississippi Valley will advance eastward and cause unsettled weather with rains in the middle and southern and rain and snow in northern districts east of the Mississippi Valley during the first part of the week. This disturbance will be followed by a marked change to colder weather as far south as Florida and the Gulf States by Monday night or Tuesday. Another disturbance that is off the North Pacific coast will advance eastward attended by general precipitation and reach the Atlantic States by Thursday. It will be preceded by rising temperature and in all probability will be followed by a widespread change to colder weather.

The storm that was central over Illinois on the morning of the 27th was over Lake Erie on the 28th, and on this date a secondary storm center developed over North Carolina and storm warnings were ordered for the Atlantic coast from Jacksonville to Boston. General precipitation attended this disturbance and strong winds prevailed in the region where storm warnings were displayed. From the 21st to 26th a general reaction to higher temperature set in over a great part of the country which was followed by much colder weather and on the 27th warnings of freezing temperature or below were ordered for the interior of the west Gulf States and on the 28th cold-wave warnings were ordered for southeastern Mississippi, southern Alabama, northern Florida, and South Carolina. On the morning of the 27th storm warnings were ordered for the north Pacific coast in connection with a disturbance off the Oregon coast at 8 a. m. of that date. From the 28th to the 30th a general cold wave prevailed in the region east of the Rocky Mountains and snow fell in the Lake region, the Ohio Valley, and the North Atlantic States. Frosts occurred in the Gulf States and northern Florida on the 29th and 30th.

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	38.7	-0.7	+14.7	+1.3
Middle Atlantic.....	15	40.4	-3.4	+10.4	+0.9
South Atlantic.....	10	51.1	-3.0	+ 4.2	+0.4
Florida Peninsula*.....	8	62.7	-3.7	- 5.9	-0.5
East Gulf.....	11	54.5	-1.1	- 1.1	-0.1
West Gulf.....	10	58.6	+2.8	+12.2	+1.1
Ohio Valley and Tennessee.....	13	41.2	-3.9	+ 1.3	+0.1
Lower Lakes.....	10	35.9	-3.0	+ 5.6	+0.5
Upper Lakes.....	12	32.1	-2.1	+20.1	+1.8
North Dakota*.....	9	24.3	-0.9	+26.4	+2.4
Upper Mississippi Valley.....	14	34.9	-2.8	+11.0	+1.0
Missouri Valley.....	11	38.8	+0.8	+20.8	+1.9
Northern slope.....	9	34.4	+2.4	+27.1	+2.5
Middle slope.....	6	45.9	+4.1	+25.1	+2.3
Southern slope*.....	7	52.7	+2.5	+18.4	+1.7
Southern Plateau*.....	11	50.4	+2.3	+18.3	+1.7
Middle Plateau*.....	10	41.9	+4.9	+19.4	+1.8
Northern Plateau*.....	9	39.0	+1.7	+12.7	+1.2
North Pacific.....	7	45.4	+0.3	- 1.3	-0.1
Middle Pacific.....	5	53.1	-0.3	- 2.7	-0.2
South Pacific.....	4	57.7	+0.6	+13.4	+1.2

* Regular Weather Bureau and selected cooperative stations.

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	3.30	92	- 0.3	- 6.0
Middle Atlantic.....	15	2.29	82	- 0.5	- 5.0
South Atlantic.....	11	1.02	34	- 2.0	- 7.3
Florida Peninsula*.....	8	1.96	91	- 0.2	- 5.3
East Gulf.....	11	2.37	68	- 1.1	- 6.6
West Gulf.....	10	1.00	32	- 2.1	- 7.5
Ohio-Valley and Tennessee.....	13	1.55	44	- 2.0	- 1.0
Lower Lakes.....	10	2.79	93	- 0.2	- 1.5
Upper Lakes.....	12	1.96	83	- 0.4	- 5.9
North Dakota*.....	9	0.33	52	- 0.3	- 6.9
Upper Mississippi Valley.....	15	0.60	29	- 1.5	- 8.9
Missouri Valley.....	11	0.16	12	- 1.2	- 4.7
Northern slope.....	9	0.83	100	0.0	- 2.8
Middle slope.....	6	0.14	15	- 0.8	- 7.2
Southern slope*.....	7	0.20	13	- 1.3	- 11.4
Southern Plateau*.....	10	1.04	162	+ 0.4	- 2.5
Middle Plateau*.....	11	0.79	89	- 0.1	- 3.4
Northern Plateau*.....	9	3.09	173	+ 1.3	- 1.1
North Pacific.....	7	9.51	130	+ 2.2	- 1.0
Middle Pacific.....	7	1.68	51	- 1.2	- 8.3
South Pacific.....	4	0.26	21	- 1.0	- 5.8

* 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.....	78	+ 2	Missouri Valley.....	66	- 5
Middle Atlantic.....	70	- 5	Northern slope.....	73	+ 6
South Atlantic.....	70	- 8	Middle slope.....	55	- 7
Florida Peninsula.....	80	0	Southern slope.....	60	- 2
East Gulf.....	72	- 4	Southern Plateau.....	59	+ 16
West Gulf.....	69	- 5	Middle Plateau.....	61	+ 3
Ohio Valley and Tennessee.....	70	- 3	Northern Plateau.....	72	- 2
Lower Lakes.....	77	0	North Pacific.....	87	+ 3
Upper Lakes.....	82	+ 2	Middle Pacific.....	80	+ 5
North Dakota.....	85	+ 6	South Pacific.....	73	+ 6
Upper Mississippi Valley.....	73	- 1			

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England.....	7.1	+ 1.6	Missouri Valley.....	4.5	- 0.3
Middle Atlantic.....	6.3	+ 1.1	Northern slope.....	6.6	+ 1.8
South Atlantic.....	3.4	- 1.4	Middle slope.....	4.3	+ 0.2
Florida Peninsula.....	2.8	- 1.8	Southern slope.....	3.8	- 0.6
East Gulf.....	4.4	- 0.6	Southern Plateau.....	2.6	- 0.4
West Gulf.....	4.0	- 0.7	Middle Plateau.....	5.0	+ 1.0
Ohio Valley and Tennessee.....	5.8	+ 0.5	Northern Plateau.....	8.3	+ 3.3
Lower Lakes.....	8.6	+ 2.6	North Pacific.....	8.4	+ 2.1
Upper Lakes.....	8.5	+ 2.7	Middle Pacific.....	6.0	+ 1.6
North Dakota.....	6.7	+ 1.7	South Pacific.....	4.5	+ 0.7
Upper Mississippi Valley.....	5.7	+ 0.7			

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Block Island, R. I.....	3	56	ne.	Nantucket, Mass.....	4	54	ne.
Do.....	4	56	ne.	North Head, Wash.....	5	60	se.
Do.....	16	50	nw.	Do.....	6	62	se.
Do.....	17	58	nw.	Do.....	7	70	se.
Do.....	26	50	nw.	Do.....	9	72	se.
Canton, N. Y.....	10	54	sw.	Do.....	10	60	s.
Cape Henry, Va.....	4	50	nw.	Do.....	19	72	se.
Cheyenne, Wyo.....	23	54	w.	Do.....	20	78	se.
Cleveland, Ohio.....	11	55	w.	Do.....	21	50	s.
Do.....	12	55	w.	Do.....	22	84	se.
Columbus, Ohio.....	10	56	w.	Pensacola, Fla.....	28	58	s.
Mount Tamalpais, Cal.....	11	65	nw.	Point Reyes Light, Cal..	11	52	nw.
Do.....	12	56	nw.	Do.....	12	52	nw.
Do.....	13	64	nw.	Do.....	18	51	nw.
Do.....	18	51	nw.	Do.....	24	54	s.
Do.....	25	58	nw.	Do.....	25	54	nw.
Mount Weather, Va.....	3	52	nw.	Tatoosh Island, Wash.....	2	57	sw.
Do.....	4	58	nw.	Do.....	5	62	se.
Do.....	5	56	nw.	Do.....	7	72	se.
Do.....	8	53	nw.	Do.....	9	67	ne.
Do.....	10	60	w.	Do.....	10	51	s.
Do.....	11	60	w.	Do.....	20	62	s.
Do.....	12	58	w.	Do.....	22	63	ne.
Do.....	13	56	w.	Do.....	26	53	ne.
Do.....	16	74	nw.	Do.....	29	52	ne.
Do.....	17	66	nw.				
Do.....	25	54	nw.				
Do.....	29	60	w.				