

Michigan, New Hampshire, New York, Ohio, and Wisconsin. 26th, Nevada and Ohio. 27th, Illinois, Iowa, Kentucky, Minnesota, Missouri, Nebraska, Nevada, and Wisconsin. 28th, Delaware, Maryland, Michigan, New Jersey, New York, Pennsylvania, and Wisconsin. 29th, Nebraska, Ohio, South Dakota, and Utah. 30th, Arkansas, Maryland, New Jersey, New York, Ohio, Oregon, Pennsylvania, South Dakota, and Tennessee. 31st, Alabama, Connecticut, New Jersey, Ohio, Oregon, and Pennsylvania.

FOG.

Few special reports of fog over the Lakes have been received, but the general heavy fogs of December 15, 16, 22, and 23 in the lower lake region seriously interfered with the working of overhead telegraph lines on those dates.

WET AND DRY SEASONS.

The character of the season as to precipitation in its relation to agriculture is shown in the following extracts and reports:

Alabama.—The periods of general rain were 1st to 3d, 6th to 9th, 13th to 16th, 29th to 31st.

Colorado.—Large excess of snow on the mountains, but deficiency of rain at low stations and in the extreme eastern, southern, and southeastern counties.

Florida.—Extensive frosts on the 19th and minor frosts on ten other days; these frosts were beneficial to the orange crop and did but little damage to garden truck and tender vegetation.

Georgia.—Unusually warm and pleasant December with deficiency of rain; the alternate freezing and thawing, accompanied by occasional showers, has rendered the soil moist and in excellent condition for agricultural purposes.

Iowa.—During a considerable portion of the month the larger part of the state was covered with sufficient snow to make good sleighing; at the close of the month the ground was generally bare; winter wheat was well protected up to the 20th or 22d; at the close the ground was very dry without much frost in it and full wheat was doing well.

Kansas.—The state is experiencing a protracted drought, seriously inconveniencing stock men and doing wheat no good, but much spring plowing is being done during this warm, dry weather.

Louisiana.—A mild and pleasant winter month; farm work has progressed favorably; cattle on the prairies in excellent condition and the loss trifling.

Minnesota.—The general precipitation was slightly in excess of the normal and as it was nearly all snowfall the ground has been well protected; the

amount of snow lying on the ground at the end of the month averaged 9.3 for the whole state and was 3 inches more than the normal for that date.

Mississippi.—The average rainfall has been 4.2 for the whole state against a normal of 5.1.

Missouri.—The precipitation for the month throughout the state was very light; at the close of the month no snow remained on the ground except at a few places in the northwest section. It has been a good month for business but not so favorable for wheat and grass, owing to a scarcity of water for some months past; many wells and springs are failing. Wheat and fruit are in good condition, but backward and would do better with more snow or rain. The frost was entirely out of the ground at the end of the month. The great fluctuations of temperature seem to have produced much sickness from "la grippe." In the southern and central portions plowing has progressed finely, but there is a great lack of water for the stock.

Nebraska.—There has been a decided deficiency of precipitation, the rain and snow having evaporated or melted without wetting the ground to any depth and the ground is too dry to freeze hard; the greater portion of the grain that has been sown this fall has not sprouted yet.

New England.—The average precipitation for the whole state is 2.9, and that of 23 stations having long records is 4.7 as compared with the normal of 3.6 for these stations. The maximum snowfall for the month has been 49 inches in northern Maine; considerable damage was done to fruit trees in eastern Massachusetts by the ice and sleet storm of December 3.

New Jersey.—The weather has generally been favorable for outdoor work, notably plowing and pruning; winter rye is in good condition.

New Mexico.—Precipitation was below the normal and was heaviest in the northern half of the territory.

Ohio.—Precipitation was in excess mostly in the form of snow; in the northern and middle sections winter wheat is fairly protected; in the southern section it is in a fair condition the freezing and thawing apparently not having had a very bad effect.

Oklahoma.—Precipitation below the normal, the weather remarkably warm and delightful; general increase in the acreage of wheat and other crops.

South Carolina.—The rainy periods were: 1st to 5th; 16th; 29th to 31st; giving an excess on the coast, but deficiency in the interior; the month was favorable for farm work and the fall crops were doing well.

Tennessee.—Precipitation slightly below the normal; fall crops healthy and growing well.

Texas.—On December 16 Capt. Joseph F. Nash reports that in many localities in western Texas no rain has fallen for five months, and consequently there is no grass, the range in many sections having been completely eaten up. Range cattle have been reduced to starvation.

Wisconsin.—Temperature below the average and precipitation considerably above the normal; the ground was covered with snow up to the 20th, but at the end of the month was bare in the southern counties; during the severe cold weather, however, the ground was amply protected and winter grains are probably in good condition as there was little or no frost in the ground; no scarcity of feed, and stock is doing well.

WIND.

The prevailing winds in December, 1893, viz., those that were recorded most frequently at Weather Bureau stations, are shown on Chart II by arrows flying with the wind. The summary of State Weather Service reports also shows the prevailing winds as recorded at voluntary stations; according to these reports northwest winds prevailed in Illinois, Iowa, Nebraska, Wyoming, Wisconsin, Minnesota, North and South Dakota, New England, New Jersey, Georgia, and Florida; southwesterly winds in the Pacific coast states, Rocky Mountain regions, the Southwest, and in Missouri, Kentucky, Indiana, Ohio, Michigan, New York, Maryland, Virginia, North and South Carolina.

HIGH WINDS.

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Weather Bureau as follows:

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Abilene, Tex.....	2	50	nw.	Cheyenne, Wyo.....	27	50	w.
Amarillo, Tex.....	2	64	sw.	Chicago, Ill.....	15	53	sw.
Do.....	24	56	n.	Do.....	18	51	nw.
Bismarck, N. Dak.....	4	56	nw.	Colorado Springs, Colo.....	3	52	nw.
Block Island, R. I.....	5	52	ne.	Davenport, Iowa.....	18	52	sw.
Buffalo, N. Y.....	10	55	w.	Dodge City, Kans.....	24	52	sw.
Do.....	16	58	w.	Fort Canby, Wash.....	30	54	s.

Wind velocities of 50 miles, or more—Continued.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Fort Canby, Wash.....	10	54	sw.	Pikes Peak, Colo.....	11	86	w.
Do.....	12	56	s.	Do.....	13	87	w.
Do.....	15	56	s.	Do.....	14	80	w.
Do.....	20	54	s.	Do.....	23	86	w.
Do.....	21	56	s.	Shreveport, La.....	15	52	w.
Do.....	31	54	s.	Tatoosh Island, Wash.....	15	51	s.
Galveston, Tex.....	16	50	n.	Do.....	21	50	sw.
Hatteras, N. C.....	5	56	nw.	Woods Holl, Mass.....	4	54	sw.
Kittyhawk, N. C.....	5	56	n.	Do.....	5	57	ne.
Lexington, Ky.....	15	50	sw.	Do.....	6	51	ne.
Nantucket, Mass.....	5	52	ne.	Do.....	11	53	w.
Pikes Peak, Colo.....	10	106	sw.	Do.....	16	50	s.
Do.....	10	88	w.	Do.....	21	55	w.

LOCAL STORMS.

2d.—During a thunderstorm, with high wind, at Water Valley, Miss., small houses and trees were blown down. A heavy snowstorm began at Chicago, Ill., at 7.10 a. m., 2d, and continued until 10.30 a. m., 3d, during which time 8 inches of snow fell, being the heaviest 24-hour snowfall on record in December at that station. Railway and street car traffic was delayed, and some damage was done to buildings at the Columbian Exposition Grounds. During a blinding snowstorm and heavy gale on Lake Michigan, 7 miles from Mich-

igan City, Ind., a tug was sunk in going to the assistance of a freight steamer, and the steamer was badly damaged. The storm was very severe throughout Illinois and Indiana and all traffic was interrupted. During a windstorm at Abilene, Tex., the wind reached a maximum velocity of 50 miles per hour from the northwest; damage was done to out-buildings.

3d.—Severe snowstorms prevailed over New Hampshire, Massachusetts, and New York. In the Pemigewasset and Suncook valleys, N. H., the storm was unusually severe and trains were delayed. At Haverhill, Mass., the snow was attended by rain and sleet, causing heavy damage. At New Bedford, Mass., a southerly storm raged all day, accompanied by heavy rain in the afternoon; considerable damage was done by flood. At Niagara Falls, N. Y., all trains were delayed by the heavy snow.

5th.—A severe storm of rain, snow, and heavy wind prevailed throughout the middle Atlantic and New England states. A number of vessels went ashore on the New England coast. At Nantasket Beach, Salem, Lynn, and Gloucester, Mass., the storm was exceptionally severe. At Block Island, R. I., the gale reached a maximum velocity of 52 miles per hour. Three miles from Block Island a schooner ran ashore; crew were saved by the Life Saving Service; vessel and part of cargo a total loss. Two vessels were wrecked on the north shore of Long Island, N. Y. At Norfolk, Va., rain continued until 2.30 p. m., changing to sleet and snow, and attended by high winds reaching a maximum velocity of 41 miles from the west. Several wrecks were reported north of Cape Charles, Va. Heavy sleet storms at Falkland and Greenville, N. C., caused great destruction to timber. At Society Hill, S. C., a sleet and snow storm did considerable damage to shrubbery and trees.

10th.—Heavy rains in northwest Washington melted the

snow in the mountains, causing all streams to overflow, and doing great damage to bridges, houses, etc.

15th.—A report from Vineyard Haven, Mass., states that 2 barges and a tug went ashore on Naushon Island during a snowstorm. A heavy windstorm of short duration, attended by heavy thunder, passed over Coushatta, La.; 2 buildings were blown down. A severe local storm visited southwest Arkansas in the afternoon. In the vicinity of Magnolia the clouds had a whirling motion and a funnel-shaped cloud was observed; the storm moved northeast and was preceded by heavy rain mixed with hail. A child was killed, and great loss of property was sustained. A heavy storm passed over southern Illinois in the evening; it was a straight blow and possessed remarkable energy. At Harrisburg great damage was done. At Vincennes and Muncie, Ind., many buildings were damaged.

16th.—During a wind and thunder storm at Marshallville, Ga., great damage was done to roofs. At Morgan, Ga., minor damage was done. A heavy gale occurred at Chattanooga, Tenn., in the early morning, damaging glass.

17th.—A thunderstorm occurred at Pasadena, Cal., at 4.30 a. m.; damage by lightning, \$1,000.

23d.—A report from Jacksonville, Fla., states that during a thunderstorm at Estero Island, on the southwest coast, a man was killed by lightning and another seriously injured.

26th.—A heavy windstorm prevailed in northern Virginia. Five miles north of Stanardsville a barn was destroyed and outbuildings were blown down. At Dale Enterprise, Va., outbuildings and fences were damaged.

27th.—A thunderstorm occurred at Los Angeles, Cal., at 7 a. m.; the lightning was vivid and the thunder very heavy. A barn was set on fire and minor damage was done by rain.

31st.—During a heavy thunderstorm at Archer, Fla., at 2 a. m., many trees were struck by lightning.

INLAND NAVIGATION.

STAGE OF WATER IN RIVERS.

The following table shows the danger-points at the various river stations; the highest and lowest stages for the month, with the dates of occurrence; and the monthly ranges for December, 1893:

Heights of rivers above low-water mark, December, 1893.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
<i>Red River.</i>						
Shreveport, La.	29.0	3.4	5	-0.7	1	4.1
<i>Arkansas River.</i>						
Fort Smith, Ark.	22.0	5.2	1	1.0	31	4.2
Little Rock, Ark.	23.0	8.5	2	4.1	31	4.4
<i>Missouri River.</i>						
Pierre, S. Dak.	13.0					
Sioux City, Iowa	18.7					
Kansas City, Mo.	21.0	5.7	29	3.1	19	2.6
<i>Mississippi River.</i>						
Saint Paul, Minn.	14.0					
La Crosse, Wis.	10.0					
Dubuque, Iowa	16.0					
Davenport, Iowa	15.0					
Keokuk, Iowa	14.0					
Hannibal, Mo.	17.0	2.0	23, 24	-1.9	4	3.9
Saint Louis, Mo.	30.0	2.5	19	0.0	9	2.5
Cairo, Ill.	40.0	13.4	28, 29	5.3	1	8.1
Memphis, Tenn.	33.0	8.2	31	2.8	4	5.4
Vicksburg, Miss.	41.0	7.8	20, 21	0.8	2, 3	7.0
New Orleans, La.	13.0	3.9	25, 26	2.0	7	1.9
<i>Ohio River.</i>						
Parkersburg, W. Va.	38.0	20.0	19	6.9	1	13.1
Cincinnati, Ohio	45.0	24.3	22	9.1	1	15.2
Louisville, Ky.	24.0	10.6	23	5.5	1	5.1
<i>Cumberland River.</i>						
Nashville, Tenn.	40.0	12.3	4	2.5	2	9.8
<i>Tennessee River.</i>						
Chattanooga, Tenn.	33.0	4.7	6, 7	2.5	1, 29	2.2
Knoxville, Tenn.	29.0	2.9	1, 5, 6	1.4	27, 31	1.5
<i>Monongahela River.</i>						
Pittsburg, Pa.	22.0	14.3	18	3.7	14	10.6

Heights of rivers—Continued.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
<i>Savannah River.</i>						
Augusta, Ga.	32.6	8.6	19	6.3	15	2.3
<i>Willamette River.</i>						
Portland, Oregon	15.0	18.7	4	5.0	31	13.7
<i>Susquehanna River.</i>						
Harrisburg, Pa.	17.0	8.8	19	2.0	15	6.8
<i>Alabama River.</i>						
Montgomery, Ala.	48.0	5.7	31	0.7	29	5.0
<i>James River.</i>						
Lynchburg, Va.	18.0	2.6	1	0.7	25	1.9
<i>Sacramento River.</i>						
Red Bluff, Cal.	22.0	7.5	2	1.8	13, 20	5.7
Sacramento, Cal.	25.0	17.3	2	11.5	14	5.8
<i>Des Moines River.</i>						
Des Moines, Iowa	19.0					

* Frozen.

FLOODS.

The above table shows that during the month of December the only river that experienced especial high water was the Willamette, at Portland, Oregon. Other reports show floods on the 4th and 5th at Oregon City, Oregon, preventing trains from passing, and in Elk Creek, washing away flour and saw mills, also in the Coquille River, damaging the railway tracks.

CLOSING OF NAVIGATION.

The weekly "bulletin of snow lying on the ground" gives reports of ice in rivers and harbors, and shows that it was sufficiently thick to impede navigation on Monday, December 4, at Davenport and Dubuque, Iowa, Green Bay, Wis., Keokuk, Iowa, La Crosse, Wis., Omaha, Nebr., Pierre,