

the night. At Cheboygan, Mich., a thunderstorm began in the early morning and ended 7.45 a. m.; a barn was struck by lightning and burned. A thunderstorm, with exceptionally high wind, visited Thornville, Mich., in the afternoon.

26th.—Severe thunderstorms occurred in New England in the early morning. At Madison, Me., a set of farm buildings were destroyed. In New Hampshire and Vermont a number of buildings were struck by lightning and burned. At Taunton, Mass., a barn was struck by lightning and burned. At Nahant, Mass., several houses were unroofed, and a number of vessels dragged anchor and parted cables. At Narragansett Pier, R. I., a thunderstorm prevailed from 5.30 to 10 a. m. At New Haven, Conn., high wind began 10 a. m., causing damage of a minor character. At Woods Holl, Mass., the wind reached a velocity of 52 miles per hour from the southwest. High northwest winds prevailed over New York. In Brooklyn, N. Y., several unfinished buildings were blown down, and two boys and a man were killed. Many

small vessels were driven ashore or sunk. At Oswego, N. Y., the wind reached a velocity of 51 miles per hour from the northwest. Damage was caused by heavy wind about Dyerberry, Pa. At Lodi, Cal., a thunderstorm occurred between 8 and 11 p. m.; east of that place, at Clements, high wind, heavy rain, and hail were reported, and a man was killed by a falling tree.

27th.—The night of the 26–27th the wind reached a velocity of 100 miles per hour from the northwest, and snow fell on the summit of Mount Washington, N. H. An exceptionally heavy rain and thunder storm was reported at Brunswick, Ga., in the morning; streets were flooded, causing great damage to property. A heavy thunderstorm from the northwest visited Columbia, Mo., in the evening.

28th.—Stock was killed by lightning at Irena, Mo., and damage was caused by lightning at Clinton, Mo.

29th.—A severe rain, wind, and hail storm visited Eagle Pass, Tex., about 6 p. m.

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:

Heights of rivers above low-water mark, Sept., 1892 (in feet and tenths).

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
<i>Red River.</i>						
Shreveport, La.	29.9	4.6	19, 20	1.7	15, 30	2.9
<i>Arkansas River.</i>						
Fort Smith, Ark.	22.0	6.2	2	1.5	30	4.7
Little Rock, Ark.	23.0	9.2	4	6.3	29, 30	2.9
<i>Missouri River.</i>						
Fort Buford, N. Dak.		7.0	1	4.9	29	2.1
Bismarck, N. Dak.		2.5	1, 2, 8	1.8	26–30	0.7
Pierre, S. Dak.		1.6	1–4	0.5	30	1.1
Sioux City, Iowa	18.7	6.4	1	5.1	30	1.3
Omaha, Nebr.	18.0	7.8	1, 2	5.9	30	1.9
Kansas City, Mo.	21.0	8.1	1	5.8	29, 30	2.3
<i>Mississippi River.</i>						
Saint Paul, Minn.	14.0	4.1	14	2.9	28	1.2
La Crosse, Wis.	11.8	3.6	15–17	2.4	30	1.2
Dubuque, Iowa	16.0	4.8	20	3.5	30	1.3
Davenport, Iowa	15.0	3.2	11, 12, 16–18	2.2	9	1.0
Keokuk, Iowa	14.0	3.5	1	2.2	30	1.3
Hannibal, Mo.	17.0	4.8	1	3.4	9, 10, 30	1.4
Saint Louis, Mo.	30.0	9.6	1	6.8	30	2.8
Cairo, Ill.	40.0	10.1	1	7.0	30	3.1
Memphis, Tenn.	33.0	7.7	1	5.1	30	2.6
Vicksburg, Miss.	41.0	11.2	1	5.3	30	5.9
New Orleans, La.	13.0	5.2	12	3.5	21–23	1.7

Heights of rivers—Continued.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
<i>Ohio River.</i>						
Parkersburg, W. Va.	38.0	5.0	2	1.9	28	3.1
Cincinnati, Ohio	45.0	7.2	7	4.8	19, 20	2.4
Louisville, Ky.	24.0	4.1	8, 9	3.4	22, 23	0.7
<i>Cumberland River.</i>						
Nashville, Tenn.	40.0	2.3	5, 6	1.1	30	1.2
<i>Tennessee River.</i>						
Chattanooga, Tenn.	33.0	4.6	17	1.3	5	3.3
Knoxville, Tenn.	29.0					
<i>Monongahela River.</i>						
Pittsburg, Pa.	29.0	6.2	12, 18	4.8	23	1.4
<i>Savannah River.</i>						
Augusta, Ga.	32.0	20.8	23	5.9	10, 12	14.9
<i>Willamette River.</i>						
Portland, Oregon	15.0	3.6	6, 7	1.2	30	2.4
<i>Susquehanna River.</i>						
Harrisburg, Pa.	17.0	2.9	1	1.1	29, 30	1.8
<i>Alabama River.</i>						
Montgomery, Ala.	48.0	7.2	25	1.8	12	5.4

At Chattanooga, Tenn., navigation on the Tennessee River was suspended on the 9th on account of low water; on the 15th, 16th, and 17th the river rose slowly, and on the 17th navigation opened on the upper Tennessee; on the 18th the river was falling; on the 21st navigation was again closed on account of low water; on the 25th and 26th the river rose slowly.

ATMOSPHERIC ELECTRICITY.

THUNDERSTORMS.

Description of the more severe thunderstorms of the month is given under "Local storms."

Thunderstorms were reported as follows: East of the Rocky Mountains they were reported in the greatest number of states, 24, on the 26th; in 23 on the 9th and 25th; in 15 to 20 on the 4th, 5th, 7th, 8th, 10th, 12th, 13th, 19th, 20th, and 21st; in 10 to 14 on the 3d, 6th, 11th, 14th, 22d, 23d, 24th, and 27th; in 5 to 9 on the 1st, 2d, 16th, 17th, 18th, 28th, 29th, and 30th. The only date on which they were reported in less than 5 states was the 15th, when they were noted in Florida and New York.

East of the Rocky Mountains thunderstorms were reported on the greatest number of dates, 30, in Florida; on 15 to 20 in Georgia, Iowa, Michigan, Mississippi, North Carolina,

Pennsylvania, and Wisconsin; on 10 to 14 in Alabama, Illinois, Indiana, Kansas, Kentucky, Louisiana, Missouri, Nebraska, New York, Ohio, South Carolina, South Dakota, Tennessee, and Texas; on 5 to 9 in Arkansas, Maryland, Minnesota, Montana, North Dakota, Oklahoma, Virginia, and West Virginia; and on 1 to 4 in Connecticut, District of Columbia, Maine, Massachusetts, New Hampshire, New Jersey, Rhode Island, and Vermont.

West of the Rocky Mountains thunderstorms were reported in Arizona on the 1st, 5th to 10th, 24th, 27th, and 30th; in California, on the 7th, 8th, 18th, 24th, 25th, 26th, 28th, 29th, and 30th; in Colorado on the 1st to 4th, 18th, 19th, 20th, 28th, and 29th; in Idaho on the 29th; in Nevada on the 1st, 2d, 9th, 14th, 19th, 24th, 25th, 26th, 28th, 29th, and 30th; in New Mexico on the 4th, 5th, 7th, 9th, and 10th; in Utah on the 2d, 26th, 28th, 29th, and 30th; in Washington on the

17th, 22d, 23d, and 24th; and in Wyoming on the 18th and 30th.

AURORAS.

Notable auroral displays of September, 1892.

Date.	Station.	Extent of display.		Remarks.
		Azimuth.	Altitude.	
1	Sault Ste. Marie, Mich..	240 to 270	20	Pale yellow color.
12	Sault Ste. Marie, Mich..	180 to 270	40	Pale yellow resting on dark segment, with beams of light.
12	Saint Paul, Minn	170 to 210	10	Pale light resting on dark segment.
12	Fort Buford, N. Dak....	180 to 225	18	Two arches, with small, brilliant streamers.
16	Grand Haven, Mich.....	90 to 160	60	Pale light, with grayish white streamers.
16	Sault Ste. Marie, Mich..	180 to 270	50	Bluish light, with shooting beams of light.
16	Saint Paul, Minn	180 to 210	60	Faint light, with vertical shooting beams.
27-28	Marquette, Mich	135 to 225	45	Faint arch, with streamers.
27	Sault Ste. Marie, Mich..	180 to 270	25	Greenish color.

Auroral displays of September, 1892—Continued.

Date.	Station.	Extent of display.		Remarks.
		Azimuth.	Altitude.	
28-29	Marquette, Mich	135 to 225	75	Pale green, with beams of light which moved from west to east.
28	Saint Paul, Minn	170 to 210	14	Pale light, with slender vertical beams of white light.
28	Havre, Mont.....	Cov'd 190	45	Pale green tint, with occasional beams.

The more widely observed auroral displays of the month were reported from New England, New York, and Pennsylvania to eastern Idaho and eastern Montana on the 12th; from New England to Iowa, Minnesota, and eastern North Dakota on the 16th; from Maine to Washington and southward to Missouri on the 27th and 28th; and from the upper lake region to Montana on the 29th.

STATE WEATHER SERVICES.

[*Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.*]

The following extracts and summaries are republished from reports for September, 1892, of the directors of the various state weather services:

ALABAMA.

Temperature.—Maximum, 110, at Union Springs, 1st; minimum, 37, at Jasper, 29th; greatest monthly range, 60, at Union Springs; least monthly range, 24, at Pittsboro.

Precipitation.—The average was 0.54 above the normal; greatest monthly, 7.51, at Maysville; least monthly, 0.73, at Livingston.—*F. H. Mell, Observer, Weather Bureau, Auburn, director.*

ARIZONA.

The month was unusually warm and dry.

Temperature.—Maximum, 111, at Arizona Canal Company's Dam, 26th, and at Yuma, 27th; minimum, 41, at Fort Apache, 5th and 27th; greatest monthly range, 55, at San Carlos; least monthly range, 24, at Farleys Camp.

Precipitation.—Greatest monthly, 1.23, at Fort Apache; least monthly, 0.00, at a number of stations.

Wind.—Prevailing direction, southwest.—*J. C. Hayden, Observer, Weather Bureau, Tucson, director.*

ARKANSAS.

Temperature.—The mean was 1.9 below the normal; maximum, 96, at Texarkana, 10th, and at Keesees Ferry, 25th; minimum, 43, at Fayetteville, Harrison, Hot Springs, and Melbourne, 14th, at Kirby, 2d, and at Melbourne, 23d; greatest monthly range, 52, at Hot Springs; least monthly range, 32, at Prescott.

Precipitation.—The average was 1.01 below the normal; greatest monthly, 6.96, at Greenville, Miss.; least monthly, trace, at Forrest.

Wind.—Prevailing direction, south.—*M. F. Locke, Commissioner of Agriculture, Little Rock, director; F. H. Clarke, Local Forecast Official, Weather Bureau, assistant.*

CALIFORNIA.

Temperature.—Maximum, 108, at Needles, 6th; minimum, 33, at Pleasanton, 4th; greatest monthly range, 60, at San Ardo and Winchester; least monthly range, 28, at Berkeley.

Precipitation.—Greatest monthly, 2.26, at Crescent City; least monthly, 0.00, at a number of stations.

Wind.—Prevailing directions, west and northwest.—*J. A. Barwick, Observer, Weather Bureau, Sacramento, director.*

COLORADO.

The month was the warmest and driest on record.

Temperature.—The mean was 4.2 above the normal; maximum, 99, at Lamar, 19th, and at Orchard, 16th; minimum, 19, at Alma, 11th; greatest monthly range, 65, at Delta; least monthly range, 42, at Grand Junction.

Precipitation.—The average was 0.80 below the normal; greatest monthly, 1.12, at Castle Rock; least monthly, 0.00, at a number of stations.

Wind.—Prevailing direction, west.—*W. S. Miller, Observer, Weather Bureau, Denver, director.*

FLORIDA.

Temperature.—Maximum, 94, at Mullet Key and Orlando, 5th, and at Bristol, 24th and 25th; minimum, 60, at Bristol, 15th, and at Pensacola, 16th; greatest monthly range, 34, at Bristol; least monthly range, 17, at Amelia.

Precipitation.—Greatest monthly, 16.67, at Titusville; least monthly, 1.72, at Pensacola.

Wind.—Prevailing direction, northeast.—*E. R. Demain, Observer, Weather Bureau, Jacksonville, director.*

GEORGIA.

Temperature.—Maximum, 98, at Bainbridge, 3d; minimum, 44, at Newnan, 29th; greatest monthly range, 45, at Louisville; least monthly range, 20, at Fleming.

Precipitation.—Greatest monthly, 20.05, at Darien; least monthly, 1.14, at Columbus.

Wind.—Prevailing direction, east.—*Park Morrill, Local Forecast Official, Weather Bureau, Atlanta, director.*

IDAHO.

Temperature.—Maximum, 94, at Boise Barracks, 15th; minimum, 20, at Lake, 8th; greatest monthly range, 60, at Boise Barracks and Lake; least monthly range, 48, at Moscow.

Precipitation.—Greatest monthly, 5.10, at Kootenai; least monthly, 0.02, at Martin.

Wind.—Prevailing direction, southwest.—*J. H. Smith, Observer, Weather Bureau, Idaho Falls, director.*

ILLINOIS.

Temperature.—The mean was 0.1 below the normal; maximum, 96, at Muddy Valley, 21st; minimum, 31, at Philo, 27th.

Precipitation.—The average was 1.02 below the normal; greatest monthly, 3.43, at Griggsville; least monthly, 0.43, at Rantoul.

Wind.—Prevailing direction, south.—*John Craig, Observer, Weather Bureau, Springfield, director.*

INDIANA.

Temperature.—The mean was 1.2 above the normal; maximum, 92, at Michigan City, 23d; minimum, 34, at Lafayette, 27th; greatest monthly range, 56, at Farmland and Point Isabel; least monthly range, 35, at New Albany.

Precipitation.—The average was 0.21 below the normal; greatest monthly, 8.00, at Huntingburg; least monthly, 1.22, at Lafayette.

Wind.—Prevailing direction, southwest.—*Prof. H. A. Huston, Lafayette, director; C. F. R. Wappenhans, Local Forecast Official, Weather Bureau, assistant.*

IOWA WEATHER AND CROP SERVICE.

Temperature.—The mean was 2.0 above the normal; maximum, 99, at Atlantic, 23d; minimum, 29, at Atlantic, 14th and 16th; greatest monthly range, 70, at Atlantic; least monthly range, 32, at Fort Madison.

Precipitation.—The average was 2.00 below the normal; greatest monthly, 4.15, at Delaware; least monthly, 0.16, at Ames.

Wind.—Prevailing direction, south.—*J. R. Sage, Des Moines, director; G. M. Chappel, Local Forecast Official, Weather Bureau, assistant.*

KANSAS.

Temperature.—The mean was 1.7 above the normal; maximum, 103, at Ulysses, 24th; minimum, 35, at Shields, 14th and 24th; greatest monthly range, 65, at Morland; least monthly range, 37, at Salina.

Precipitation.—The average was 1.23 below the normal; greatest monthly, 3.99, at Kellogg; least monthly, 0.00, at Colby and New England Ranch.

Wind.—Prevailing direction, south.—*Prof. J. T. Lovewell, Topeka, director; T. B. Jennings, Observer, Weather Bureau, assistant.*

KENTUCKY.

Temperature.—The mean was about 1.0 below the normal; maximum, 93,