

North Carolina.—Wilmington, Smithville, New River Inlet and Fort Macon, 19th; Charlotte and Asheville, 23d; Statesville, 4th, 20th, 23d, 24th; Weldon, 22d, 23d, 24th.

Ohio.—North Lewisburg, 15th; Hiram, 15th, 16th; Westerville, Ruggles, Toledo, College Hill and Jacksonburg, 16th; Cincinnati, 16th, 23d.

Pennsylvania.—Fallsington, 4th; Leetsdale, 11th; Chambersburg and Pittsburg, 23d; Erie, 16th; Philadelphia and Dyberry, 24th.

Rhode Island.—Point Judith, 19th, 20th; Narragansett Pier and Block Island, 28th.

South Carolina.—Stateburg, 18th.

Tennessee.—Nashville, 5th, 23d; Memphis, 16th; Chattanooga, 20th, 23d.

Texas.—Fort Concho, 15th, 21st, 22d; Cleburne, 2d, 15th, 22d; Austin, 20th; Indianola, 16th; Palestine, 20th, 30th; Brownsville, 1st; Fort Stockton, 15th, 20th, 22d; Fort Davis, 22d, El Paso, 15th.

Virginia.—Variety Mills, 1st; Marion, 23d, Blacksburg, 21st; Lynchburg, 23d; Fort Myer, 1st, 28th.

Wisconsin.—La Crosse, 5th.

HAIL.

Hail is reported to have fallen in the following states and territories:

Alabama.—Birmingham and Greensboro, 27th.

Delaware.—Delaware Breakwater, 1st.

Illinois.—Swauwick, 11th.

Indiana.—Spiceland, 11th; Vevay, 16th.

Iowa.—Guttenberg, 24th.

Kansas.—Leavenworth, 4th, 7th, 8th; Wyandotte, 14th.

Kentucky.—Richmond, 7th.

Louisiana.—Liberty Hill, 16th, 30th; Point Pleasant, 27th.

Maine.—Portland, 16th; Cornish, 17th.

Massachusetts.—Somerset, 15th, 16th, 28th; Westborough, 16th, 24th; Williamstown and Worcester, 12th; Taunton, 1st.

Montana.—Fort Ellis, 7th.

Nevada.—Fort McDermitt, 11th.

New Jersey.—Atlantic City and Moorestown, 4th.

New York.—Le Roy and Factoryville, 16th.

North Carolina.—Chapel Hill 23d.

Ohio.—Sandusky, 16th; Jacksonburg, 30th.

Oregon.—Portland, 1st, 16th.

Tennessee.—Milan, 11th; Austin, 12th; Nashville, 12th, 16th, 23d, 25th.

Texas.—Fort Davis and El Paso, 15th; Austin, 29th; Cleburne, 2d, 4th, 15th, 22d.

Utah.—Nephi, 11th.

Virginia.—Fort Myer, 12th; Dale Enterprise, 15th.

Wisconsin.—Embarras, 31st.

PRECIPITATION FROM CLOUDLESS SKY.

Fort Myer, Virginia, 7th, at 7.15 p. m., when about four-tenths of the sky were covered with clouds, which were along the horizon, there was a light sprinkle of rain, the sky overhead, from which the rain seemed to fall, being perfectly clear.

Detroit, Michigan, 12th, at 7.15 p. m., the sky was clear except a heavy bank of clouds on the northwestern horizon; from that hour until 8.20 p. m., light snow fell in the outskirts of the city to a depth of two-tenths of an inch; the sky during the time above mentioned was of a hazy appearance.

Leetsdale, Pennsylvania, 19th, at 6.20 p. m., snow fell from a cloudless sky for about three minutes; the flakes were small.

Cincinnati, Ohio, 22d, fine snow fell from a cloudless sky from 8.32 to 8.55 a. m.; the quantity was insufficient to whiten the ground.

Sussex, Waukesha county, Wisconsin: on the 20th, snow fell when no clouds were visible at a greater altitude than 10° above the horizon.

WINDS.

The most frequent directions of the wind during January, 1885, are shown on chart ii. by arrows flying with the wind.

In the northern districts east of the Rocky mountains they were from southwest to northwest, except in the lower Missouri valley, where they were southerly; in Tennessee, the south Atlantic and Gulf states they were from north to east; at the Rocky mountain stations and on the Pacific coast they were variable.

HIGH WINDS.

(In miles per hour.)

During the month of January high winds were reported as follows:

On the summit of Mount Washington, New Hampshire, the wind reached a velocity of fifty miles per hour daily, with the exception of the 16th, on which date the maximum velocity was forty miles from the southeast. Velocities exceeding one hundred miles per hour were as follows: 100, nw., 10th; 110, s., 12th; 102, w., 17th; 101, w., 18th; 110, nw., 22d; 116, nw., 28th; 120, nw., 29th.

The total movement for the month was 36,515, the greatest recorded since the establishment of the station in 1870.

Velocities of fifty or more miles per hour were recorded at other stations, as follows:

Pike's Peak, Colorado, 60, ne., 5th; 80, nw., 6th; 84, nw., 7th; 68, w., 8th; 54, w., 9th; 84, w., 10th; 56, nw., 12th; 88, nw., 16th.

Cape Mendocino, California, 58, s., 1st; 54, s., 4th; 92, s., 6th; 84, s., 7th; 58, se., 9th; 56, s., 10th; 62, se., 16th; 56, s., 28th; 56, s., 29th; 56, s. and se., 30th; 72, s., 31st.

Cape May, New Jersey, 52, w., 17th; 60, nw., 22d; 58, nw., 24th; 60, nw., 26th; 62, nw., 28th.

Sandy Hook, New Jersey, 54, nw., 10th; 68, nw., 17th; 58, nw., 28th.

Buffalo, New York, 71, sw., 17th; 53, nw., 26th.

Rochester, New York, 60, sw., 17th.

Fort Macon, North Carolina, 70, sw., 12th.

Fort Cauby, Washington Territory, 62, se., 3d.

LOCAL STORMS AND TORNADOES.

Vernon, Lamar county, Alabama: on the 11th a tornado started at a point two miles north of this place; it passed eight miles north of Fayette, Fayette county, and ended near Eldridge, Walker county. The path of the tornado was from one-fourth to one-half mile in width, and its length was about forty miles; it began at about 5 p. m. and moved in a direction slightly north of east; the velocity of the tornado cloud was thirty miles per hour. One person was killed, several were wounded, and many dwellings were destroyed.

Tuskegee, Macon county, Alabama: at 11 p. m., on the 11th, a tornado occurred eleven miles east of this place, and moved east 20° north, its path being 2,640 feet wide. One person was killed, and several houses were destroyed.

Brooksville, Blount county, Alabama: a tornado occurred at this place at 7 p. m., on the 11th; it moved east 20° north, passing four miles southwest of Albertville, Marshall county, and ended four miles west of Collinsville, De Kalb county. The width of the tornado's path was from 600 to 690 feet, and its length thirty-five miles. The velocity of the tornado was thirty miles per hour. Three persons were killed and many wounded; sixteen dwellings and numerous outbuildings were destroyed. The damage to property is estimated at \$100,000.

Eutaw, Greene county, Alabama: at 6.30 p. m. on the 11th a tornado began at a point eight miles south of this place; it moved east 20° north, passing three miles north of Sawyersville, Hale county; the same distance north of Randolph, Bibb county; and ended ten miles south of Calera, Shelby county. The width of the tornado's path was from 900 to 1,320 feet and its length seventy miles. The tornado cloud was funnel-shaped and moved at the rate of fifteen miles per hour. Five persons were killed, and many dwellings and other buildings destroyed.

Mount Olive, Coosa county, Alabama: at 9 p. m. on the 11th a tornado occurred five miles north of this place; it moved east 10° north, its path being 2,640 feet in width and twenty miles

in length. Two persons were killed and several wounded; many dwellings and out-buildings were destroyed, entailing a loss of \$100,000. A tornado also occurred on this date in Randolph county, between Wedowee and Roanoke, killing two persons and destroying many buildings.

Waverly, Clay county, Mississippi: at 5 p. m. on the 11th a tornado occurred five miles north of this place. The cloud is reported to have been balloon-shaped, its path being from six to seven miles in length; some houses were blown down.

Haddock's station, Jones county, Georgia: a tornado occurred three miles north of this place at noon on the 12th; it moved east 25° north for a distance of twelve miles, passing two miles south of Brown's Crossing, Baldwin county, and ending one mile north of Milledgeville, in the same county; its path was from six to nine hundred feet in width. No loss of life occurred, but four persons were wounded; three dwellings and many out-buildings were destroyed.

Herndon, Buck county, Georgia: at 3 a. m. on the 12th, a tornado occurred in the southern part of this county, and moved eastward, the width of the tornado's path being 3000 feet. Four persons were injured, and twenty dwellings and numerous out buildings were destroyed.

East Liverpool, Columbiana county, Ohio: a violent storm occurred at this place about midnight of the 16-17th, causing great damage. The storm was preceded by a heavy roaring sound resembling that caused by a moving train. Numerous buildings at this place were unroofed or otherwise damaged; considerable damage is also reported from the surrounding country.

Albany, Dougherty county, Georgia: during the night of the 16th-17th, a tornado passed through this county, nine miles east of Albany. Timber, fences and buildings were blown down.

Steubenville, Jefferson county, Ohio: a severe storm prevailed here during the night of the 16-17th. Several buildings were damaged and trees blown down.

Pike's Peak, Colorado: very high wind prevailed on the 16th; the maximum velocity was eighty-eight miles from the northwest; a part of the stable roof was torn off, and carried a distance of one hundred yards; broken planks, etc., were carried down the mountain side for a distance of one-half mile.

The observer on the summit of Mount Washington, New Hampshire, reports the following: the barometer fell rapidly on the 21st, and during the evening, the wind increased to hurricane force, attaining a velocity of ninety-five miles. The hurricane continued during the following day without abatement, a velocity of one hundred and ten miles occurring. On this date the total wind movement was 2,140 miles, which is the largest daily movement ever recorded at this station. From 11 p. m. on the 21st, to 3 p. m. on the 22d, the average hourly velocity was ninety-five miles, and this figure is less than the actual velocity, as frost-work on the anemometer caused it to record a velocity less than the actual movement.

NAVIGATION.

STAGE OF WATER IN RIVERS.

The Missouri river was frozen during the entire month at Leavenworth, Kansas, and to the northward.

The Mississippi river was frozen at Keokuk, Iowa, and to the northward. At Keokuk, the ice moved slightly on the afternoon of the 8th, and during the succeeding twenty-four hours the river rose from 11.6 feet to 14.2 or 0.2 above the danger-line. Observations of the river's height were made at Keokuk from the 8th to 13th; although the river was frozen during that time there was a range of 2.6 feet. At Vicksburg, Mississippi, the highest stage occurred on the 31st, when the water was 1.3 feet above the danger-line.

In the Ohio river, at Pittsburg, the water rose to one foot above the danger line on the 17th, and at Cincinnati, Ohio, it was within four and two-tenths feet of the danger-line, when at its highest stage on the 19th.

The largest ranges of water occurred in the Ohio river at Cincinnati, and in the Cumberland river at Nashville, being 32.5 feet in the former and 33.8 in the latter.

In the following table are shown the danger points in the rivers at the various stations, the highest and lowest depths for January, 1885, with the dates of occurrence, and the monthly ranges:

Heights of rivers above low-water mark, January, 1885.

[Expressed in feet and tenths]

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River:</i>						
Shreveport, Louisiana.....	29 9	16	28 6	1	20 6	8 0
<i>Arkansas:</i>						
Fort Smith, Arkansas.....	15 0	1	11 5	23, 24	0 8	12 3
Little Rock, Arkansas.....	23 0	1	23 3	27, 28	8 0	15 3
<i>Missouri:</i>						
Yankton, Dakota*.....	24 0					
Omaha, Nebraska*.....	18 0					
Leavenworth, Kansas*.....	20 0					
<i>Mississippi:</i>						
Saint Paul, Minnesota*.....	14 6					
La Crosse, Wisconsin*.....	24 0					
Dubuque, Iowa*.....	16 0					
Keokuk, Iowa*.....	14 0	9	14 2	8	11 6	2 6
Keokuk, Iowa †.....	14 0	9	14 2	8	11 6	2 6
Saint Louis, Missouri.....	32 0	2	17 5	29	8 8	8 7
Cairo, Illinois.....	40 0	25, 26	30 0	1	27 0	12 0
Memphis, Tennessee.....	34 0	28	30 2	1	15 8	14 4
Vicksburg, Mississippi.....	41 0	31	42 3	1	17 2	25 1
New Orleans, Louisiana †.....	-3 0	23, 31	-1 7	1	-10 6	8 9
<i>Ohio:</i>						
Pittsburg, Pennsylvania.....	22 0	17	23 0	31	2 9	20 1
Cincinnati, Ohio.....	50 0	19	45 8	29	13 3	32 5
Louisville, Kentucky.....	25 0	20, 21	21 9	4, 5	6 7	15 2
<i>Cumberland:</i>						
Nashville, Tennessee.....	40 0	21	37 8	5	4 0	33 8
<i>Tennessee:</i>						
Knoxville, Tennessee.....	33 0	18	26 5	1, 5	3 6	22 9
<i>Monongahela:</i>						
Pittsburg, Pennsylvania.....	29 0	17	23 0	31	2 9	20 1
<i>Savannah:</i>						
Augusta, Georgia.....	32 0	26	27 5	4	7 0	20 5
<i>Mobile:</i>						
Mobile, Alabama.....	31	17 6	1	12 0	5 6	
<i>Sacramento:</i>						
Red Bluff, California.....						
Sacramento, California.....		1	23 5	31	17 0	6 5
<i>Willamette:</i>						
Portland, Oregon.....		9	15 9	27	1 9	14 0
<i>Colorado:</i>						
Yuma, Arizona.....						

‡ Below bench mark. † Below high-water mark of 1874 and 1883.
* Frozen the entire month. ‡ Observations from 8th to 13th, although frozen.

ICE IN RIVERS AND HARBORS.

Arkansas river.—Fort Smith, Arkansas: floating ice on 17th, 18th, 19th, 22d; river free from ice on 25th.

Sherlock, Finney county, Kansas: ice was of a thickness sufficient to bear the weight of teams during the latter half of the month.

Casco bay.—Portland, Maine: on the 23d the harbor was filled with floating ice; on the 22d the steamer "Popham," was cut through by the ice and sank on Phippsburg flats.

Chincoteague bay.—Chincoteague, Virginia: the bay froze over on the 23d.

Connecticut river.—Hartford, Connecticut: the river froze over on the 21st and 22d for the third time this winter; on the latter date the river was frozen for a distance of five hundred miles, and within five miles of Long Island sound.

Delaware bay.—Delaware Breakwater, Delaware: on the 23d the harbor was filled with ice which went out at ebb tide.

Detroit river.—Detroit, Michigan: floating ice 2d, 3d, 10th, 11th, 13th, 15th, 19th, 20th, 22d, 24th, 25th.

Grand river.—Grand Haven, Michigan: on the 1st, the river was frozen along the shores and the channel was filled with slush ice; the river was nearly free from ice on the 3d; on the 13th it was partially frozen.

Lansing, Michigan: the river closed on the 15th for the third time this winter.

Grand Traverse bay.—Traverse City, Michigan; the bay froze on the 26th.

Hudson river.—Albany, New York: on the 1st, the ice began to move and formed a dam at Van Wie's point, causing the